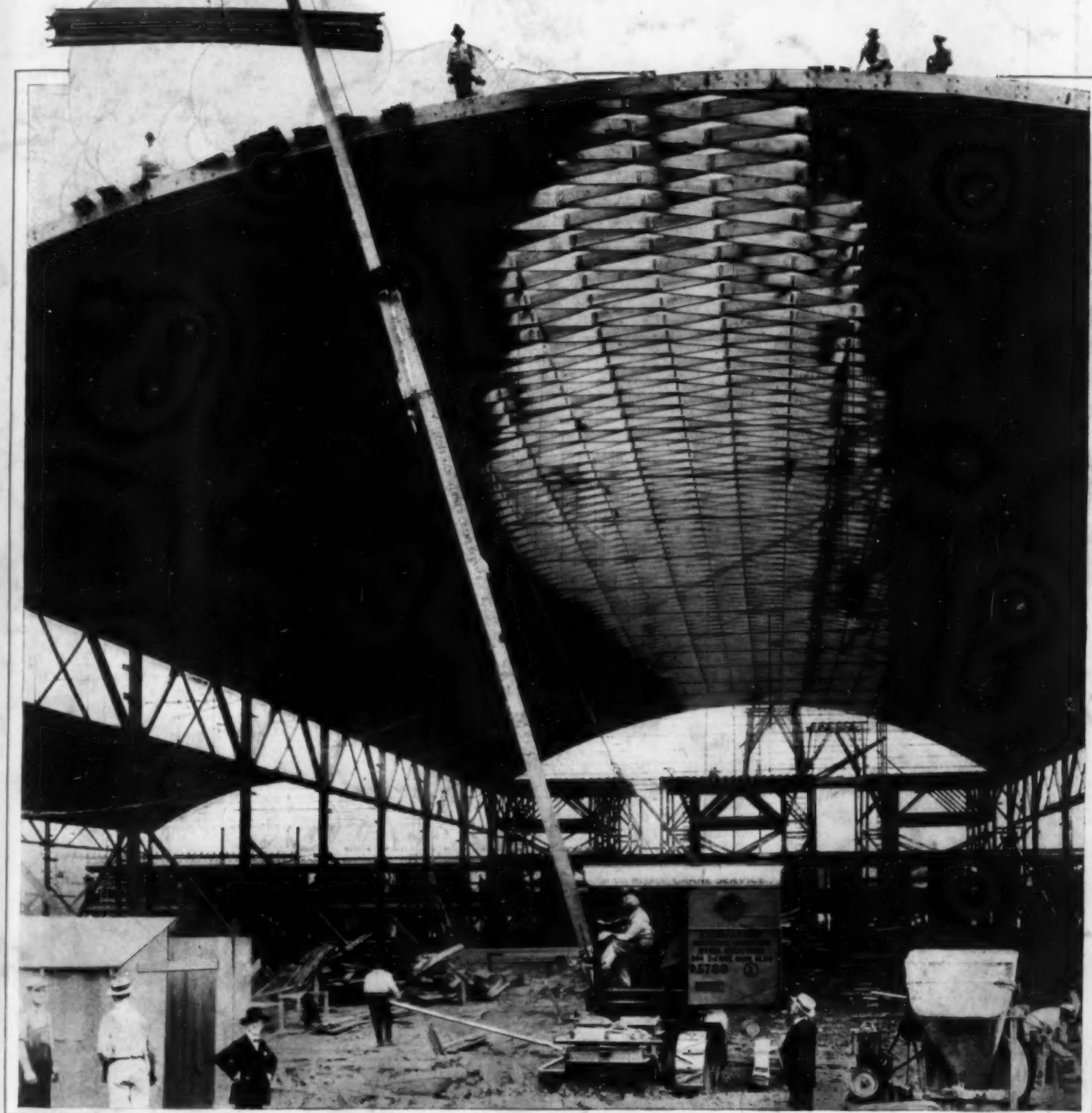


First Copy

July  
1928

# Construction Methods

McGraw-Hill Publishing Company, Inc., New York, N. Y.



Building Trussless Roof for National Democratic Convention Hall  
in Houston, Texas

A MONTHLY PICTORIAL OF FIELD PRACTICE AND EQUIPMENT  
General Construction • Highways • Buildings • Engineering • Industrial

Akron, Ohio; Alameda, Calif.; Alhambra, Calif.; Albany, N. Y.; Allentown, Pa.; Alliance, Ohio; Alton, Ill.; Altoona, Pa.; Amsterdam, N. Y.; Anderson, Ind.; Arlington, Mass.; Asheville, N. C.; Ashtabula, Ohio; Atlanta, Ga.; Atlantic City, N. J.; Auburn, N. Y.; Augusta, Ga.; Aurora, Ill.; Austin, Texas; Bakersfield, Calif.; Baltimore, Md.; Bangor, Me.; Baton Rouge, La.; Battle Creek, Mich.; Bay City, Mich.; Bayonne, N. J.; Beaumont, Texas; Belleville, Ill.; Bellingham, Wash.; Beloit, Wis.; Berkeley, Calif.; Bethlehem, Pa.; Binghamton, N. Y.; Birmingham, Ala.; Bloomfield, N. J.; Bloomington, Ill.; Boston, Mass.; Bridgeport, Conn.; Bristol, Conn.; Brockton, Mass.; Brookline, Mass.; Buffalo, N. Y.; Burlington, Ia.; Butler, Pa.; Butte, Mont.; Cambridge, Mass.; Camden, N. J.; Canton, Ohio; Cedar Rapids, Ia.; Central Falls, R. I.; Charleston, S. C.; Charleston, W. Va.; Charlotte, N. C.; Chattanooga, Tenn.; Chelsea, Mass.; Chester, Pa.; Chicago, Ill.; Chicopee, Mass.; Cicero, Ill.; Cincinnati, Ohio; Clarksburg, W. Va.; Cleveland, Ohio; Clifton, N. J.; Clinton, Ia.; Colorado Springs, Colo.; Columbia, S. C.; Columbus, Ga.; Columbus, Ohio; Council Bluffs, Ia.; Covington, Ky.; Cranston, R. I.; Cumberland, Md.; Dallas, Texas; Danville, Ill.; Davenport, Ia.; Dayton, Ohio; Daytona Beach, Fla.; Decatur, Ill.; Denver, Colo.; Des Moines, Ia.; Detroit, Mich.; Dubuque, Ia.; Duluth, Minn.; Durham, N. C.; East Chicago, Ind.; East Cleveland, Ohio; Easton, Pa.; East Orange, N. J.; East Providence, R. I.; East St. Louis, Ill.; Eldorado, Ark.; Elgin, Ill.; Elizabeth, N. J.; Elkhart, Ind.; Elmira, N. Y.; El Paso, Texas; Erie, Pa.; Evanston, Ill.; Evansville, Ind.; Everett, Mass.; Everett, Wash.; Fall River, Mass.; Fargo, N. D.; Fitchburg, Mass.; Flint, Mich.; Fond du Lac, Wis.; Fort Smith, Ark.; Fort Wayne, Ind.; Fort Worth, Texas; Fresno, Calif.; Galesburg, Ill.; Galveston, Texas; Garfield, N. J.; Gary, Ind.; Grand Rapids, Mich.; Great Falls, Mont.; Green Bay, Wis.; Greensboro, N. C.; Greenville, S. C.; Greenwich, Conn.; Hagerstown, Md.; Hamilton, Ohio; Hammond, Ind.; Hamtramck, Mich.; Harrisburg, Pa.; Hartford, Conn.; Haverhill, Mass.; Hazleton, Pa.; Highland Park, Mich.; Hoboken, N. J.; Holyoke, Mass.; Houston, Texas; Huntington, W. Va.; Hutchinson, Kan.; Indianapolis, Ind.; Irvington, N. J.; Jackson, Mich.; Jacksonville, Fla.; Jamestown, N. Y.; Jersey City, N. J.; Johnstown, Pa.; Joliet, Ill.; Joplin, Mo.; Kalamazoo, Mich.; Kansas City, Kan.; Kansas City, Mo.; Kearney, N. J.; Kenosha, Wis.; Kingston, N. Y.; Knoxville, Tenn.; Kokomo, Ind.; La Crosse, Wis.; Lakeland, Fla.; Lakewood, Ohio; Lancaster, Pa.; Lansing, Mich.; Laredo, Texas; Lawrence, Mass.; Lebanon, Pa.; Lewiston, Me.; Lexington, Ky.; Lima, Ohio; Lincoln, Neb.; Little Rock, Ark.; Long Beach, Calif.; Lorain, Ohio; Los Angeles, Calif.; Louisville, Ky.;



Lindell Boulevard, St. Louis, Mo.  
Paved with durable TEXACO Sheet Asphalt.

Lowell, Mass.; Lynchburg, Va.; Lynn, Mass.; McKeesport, Pa.; Macon, Ga.; Madison, Wis.; Malden, Mass.; Manchester, N. H.; Mansfield, Ohio; Marion, Ind.; Marion, Ohio; Meriden, Conn.; Medford, Mass.; Memphis, Tenn.; Miami, Fla.; Middletown, Ohio; Milwaukee, Wis.; Minneapolis, Minn.; Mobile, Ala.; Moline, Ill.; Montclair, N. J.; Montgomery, Ala.; Mt. Vernon, N. Y.; Muncie, Ind.; Muskegon, Mich.; Muskogee, Okla.; Nanticoke, Pa.; Nashville, Tenn.; Nashua, N. H.; Newark, N. J.; Newark, Ohio; New Bedford, Mass.; New Britain, Conn.; New Brunswick, N. J.; Newburgh, N. Y.; Newcastle, Pa.; New Haven, Conn.; New London, Conn.; New Orleans, La.; Newport, Ky.; Newport, R. I.; Newport News, Va.; New Rochelle, N. Y.; Newton, Mass.; New York, N. Y.; Niagara Falls, N. Y.; Norfolk, Va.; Norristown, Pa.; Norwalk, Conn.; Norwood, Ohio; Oakland, Calif.; Oak Park, Ill.; Ogden, Utah; Oklahoma City, Okla.; Okmulgee, Okla.; Omaha, Nebr.; Orange, N. J.; Oshkosh, Wis.; Ottumwa, Ia.; Paducah, Ky.; Pasadena, Calif.; Passaic, N. J.; Paterson, N. J.; Pawtucket, R. I.; Pensacola, Fla.; Peoria, Ill.; Perth Amboy, N. J.; Petersburg, Va.; Philadelphia, Pa.; Phoenix, Ariz.; Pittsburgh, Pa.; Pittsfield, Mass.; Plainfield, N. J.; Pontiac, Mich.; Port Arthur, Texas; Port Huron, Mich.; Portland, Me.; Portland, Oregon; Portsmouth, Ohio; Portsmouth, Va.; Poughkeepsie, N. Y.; Providence, R. I.; Pueblo, Colo.; Quincy, Ill.; Quincy, Mass.; Racine, Wis.; Raleigh, N. C.; Reading, Pa.; Revere, Mass.; Richmond, Ind.; Richmond, Va.; Riverside, Calif.; Roanoke, Va.; Rochester, N. Y.; Rockford, Ill.; Rock Island, Ill.; Rome, N. Y.; Sacramento, Calif.; Saginaw, Mich.; St. Joseph, Mo.; St. Louis, Mo.; St. Paul, Minn.; St. Petersburg, Fla.; Salem, Mass.; Salt Lake City, Utah; San Antonio, Texas; San Bernardino, Calif.; San Diego, Calif.; Sandusky, Ohio; San Francisco, Calif.; San Jose, Calif.; San Pedro, Calif.; Santa Ana, Calif.; Santa Barbara, Calif.; Santa Monica, Calif.; Savannah, Ga.; Schenectady, N. Y.; Scranton, Pa.; Seattle, Wash.; Sharon, Pa.; Sheboygan, Wis.; Shenandoah, Pa.; Shreveport, La.; Sioux City, Ia.; Sioux Falls, S. D.; Somerville, Mass.; South Bend, Ind.; Spartanburg, S. C.; Spokane, Wash.; Springfield, Ill.; Springfield, Mass.; Springfield, Mo.; Springfield, Ohio; Stamford, Conn.; Steubenville, Ohio; Stockton, Calif.; Superior, Wis.; Syracuse, N. Y.; Tacoma, Wash.; Tampa, Fla.; Taunton, Mass.; Terre Haute, Ind.; Toledo, Ohio; Topeka, Kan.; Torrington, Conn.; Trenton, N. J.; Troy, N. Y.; Tucson, Ariz.; Tulsa, Okla.; Union City, N. J.; Utica, N. Y.; Waco, Texas; Waltham, Mass.; Warren, Ohio; Washington, D. C.; Waterbury, Conn.; Waterloo, Ia.; Watertown, Mass.; Watertown, N. Y.; Wheeling, W. Va.; White Plains, N. Y.; Wichita, Kan.; Wichita Falls, Texas; Wilkes Barre, Pa.; Wilkinsburg, Pa.; Williamsport, Pa.; Wilmington, Del.; Wilmington, N. C.; Winston-Salem, N. C.; Woonsocket, R. I.; Worcester, Mass.; Yonkers, N. Y.; York, Pa.; Youngstown, Ohio; Zanesville, Ohio.

## 2 out of 3 Cities with over 25,000 population

"What are the 'big fellows' doing?" is always a question of considerable interest, and the answer of considerable aid, to a smaller city or town considering a public improvement.

When deciding what type of pavement to construct, consider that 2 out of 3 of our leading cities—those with over 25,000 population—have streets paved with

# TEXACO ASPHALT

New York  
Philadelphia  
Richmond  
Boston  
Jacksonville



The Texas Company  
ASPHALT SALES DEPT.  
17 Battery Place, New York City



Chicago  
Cleveland  
Kansas City  
Houston  
Dallas





**A** ROAD ACROSS THE EVERGLADES—Unprecedented conditions for the construction of a highway were encountered in Florida by the builders of the Tamiami Trail across the Everglades, as described on p. 6 of this issue. To drill and dig the rock which underlies this flat, swampy



wilderness, and to grade the excavated material after it had been deposited in the fill, new machinery and methods had to be developed. In meeting the problems of this difficult work the contractors found strong support in the equipment manufacturers. The best engineers of the manufacturing companies spent weeks in the Everglades advising, experimenting, testing. As a result of their service the first contractor to tackle a rock section was equipped with a drilling outfit suited to Everglades conditions, with dredges capable of excavating the blasted lime rock, and with grading tools sturdy enough to work the broken rock in the fill. Today the completed highway stands as a monument not only to the promoters, the engineers, and the contractors who projected and built it, but also to the machinery makers, without whose assistance the Tamiami Trail highway would still, in all probability, be a vision instead of a reality.

*Cleveland Again—The American Road Builders' Association has just announced that Cleveland has been chosen for the 1929 Road Show. That's good news. The facilities at the Public Auditorium are ideal for exhibiting and inspecting the huge quota of equipment and materials that the road-builder uses. Put down the date—Jan. 14 to 18—and be there.*

## CONSTRUCTION METHODS

*A monthly review of modern construction practice and equipment*

PUBLISHED BY  
MCGRAW-HILL PUBLISHING COMPANY, INC.  
TENTH AVENUE AT 38TH ST., NEW YORK

### From the Mail Bag

"Your pictures every month tell more than a long article. I always read your advertisements as I like to keep posted on new equipment and new methods of getting things done."—Road grading and paving contractor, New Jersey.

"Probably three out of five men who take and read *Construction Methods* file the 'Step-by-Step Field Methods' sheets."—Construction engineer, Texas.



"It is a valuable magazine; every page is interesting and worth while. I wish it would come out every week."—Contractor, Ohio.

"Keep articles boiled down and plenty of pictures as you are now doing, and I'll be a life booster for *Construction Methods*."—Highway maintenance engineer, New York.

"Have been a subscriber to *Construction Methods* since 1926 and would not be without it at any price."—General superintendent, Missouri.

"Fills a need no other publication I know of supplies."—County engineer, Virginia.

"Pictures are the best descriptive language that can be used and I get more 'story' from *Construction Methods* in twenty minutes than I can get from reading articles in two hours. I like your 'Step-by-Step' pictures particularly well."—County engineer, Indiana.

"I have followed your suggestions on several jobs."—Structural engineer, Ohio.

**EXPENSIVE ECONOMY**—"I have seen \$8,000 street flushers worn out in half the usual time [when forced into service to drag blade graders] because some bright economy hound lopped off an \$1,800 tractor item from the budget."—City Engineer Lawver, of Fort Collins, Colo.

AN EGYPTIAN OASIS was needed in a hurry as part of the setting for the Shrine convention at Miami, Fla., last May. To the John B. Orr Construction Company was given the responsibility of filling this unusual order, involving the creation of an Avenue of the Gods lined with plaster



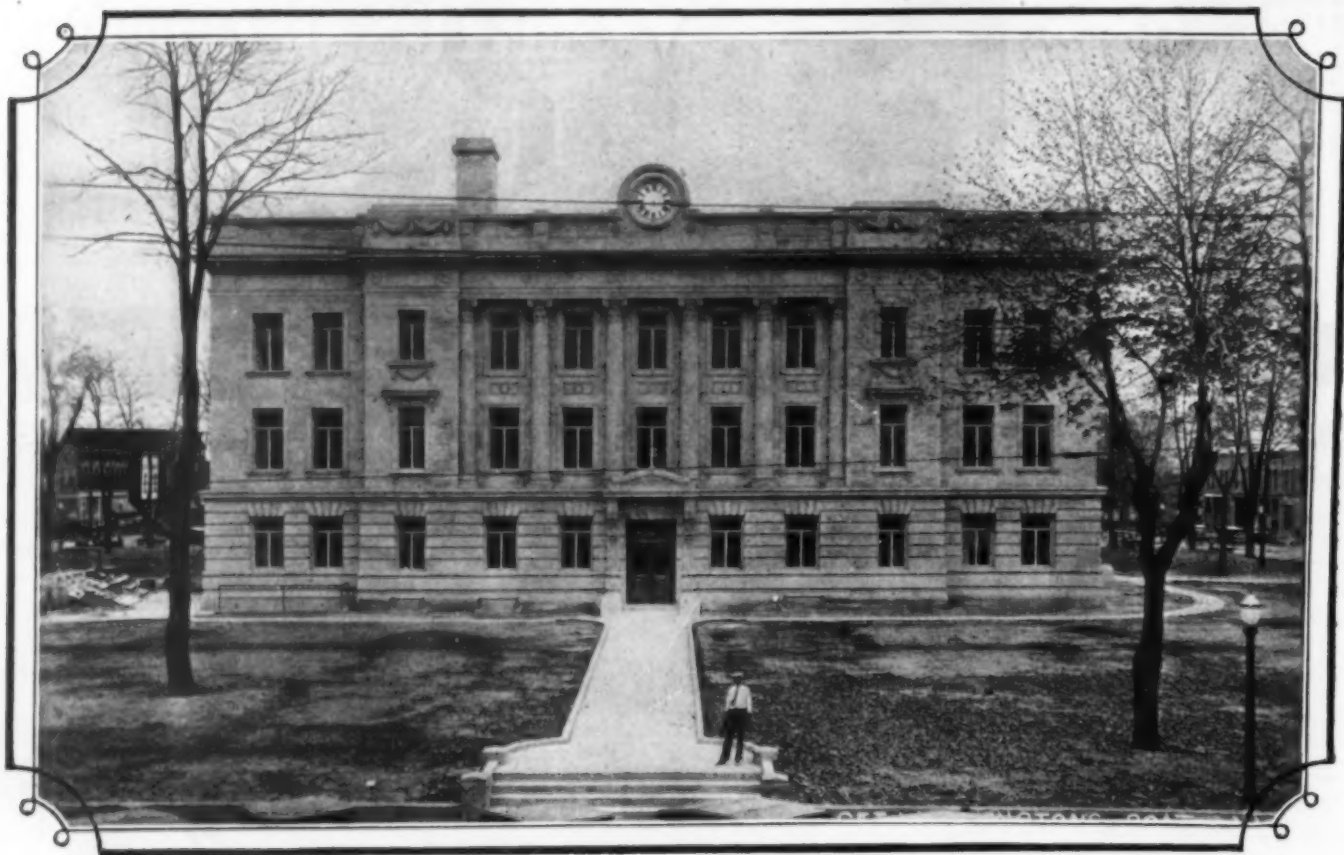
statues of Pharaoh 16 ft. high. Here was a job calling for a combination of special talents—sculptor, landscape architect, constructor and plaster specialist. How the Orr crew handled this out-of-the-ordinary assignment is told pictorially on p. 25.

**FALSE GODS**—On highway grading work, according to the results of an extensive field investigation by T. W. Allen and A. P. Anderson, of the U. S. Bureau of Public Roads, the power shovel is the primary producer. All production is dependent on it. Here is a sentence from their report for contractors to memorize and apply:

"An inferior shovel or operator is a certain guarantee that production costs will be high."

Added evidence, this, of the fallacy of worshipping at the shrine of **LOW PRICE**, either in purchasing construction equipment or hiring the men to run it.

**C**OMING: Pictorial articles scheduled for early publication in *Construction Methods* include: Building a 40-ft. concrete highway, 16 miles long, through eleven towns and villages, a Johnson, Drake & Piper job. Lining an irrigation canal. Constructing a 66-in. sewer on a concrete trestle. Heavy highway grading in Missouri.



## ... How We Saved Time and Cut Costs in Building the Sullivan County Court House

By M. F. Stephens  
Sup't for Walter R. Heath  
General Contractor, Greencastle, Ind.

"How can we hurry completion of our new court house and at the same time secure unusually strong construction?" Askt the officials of Sullivan County, Indiana.

We answered both of their questions.

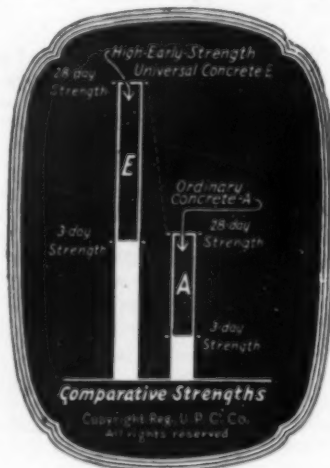
Concrete footings, basement walls, floors, steps, walks and driveways were ready for service 3 days after placing. This speeded up other parts of the job and as a result the court house was ready for use much earlier than otherwise would have been possible.

In furnishing speed we also provided

permanently better and stronger concrete—and at the same time, because of our ability to strip and re-use forms in 72 hours, we effected substantial savings in form costs.

To secure these results we used *High-Early-Strength Universal Concrete* made with *usual materials, usual labor, usual equipment and usual Universal cement*—the same kind that we use for ordinary construction—all applied according to the definite methods\* outlined by the Universal company.

\*Information on these methods will be mailed promptly on receipt of the accompanying coupon.



Universal Portland Cement Co., 208 South La Salle Street, Chicago

Without obligation, send me detailed information on methods for securing strong concrete in 3 days with the *usual materials, usual equipment, usual labor and usual Universal cement.*

Name .....

Address ..... C. M. 7-28



# Construction Methods

McGraw-Hill  
Publishing Company, Inc.  
JAMES H. MCGRAW, President  
EDWARD J. MEHREN, Vice-president

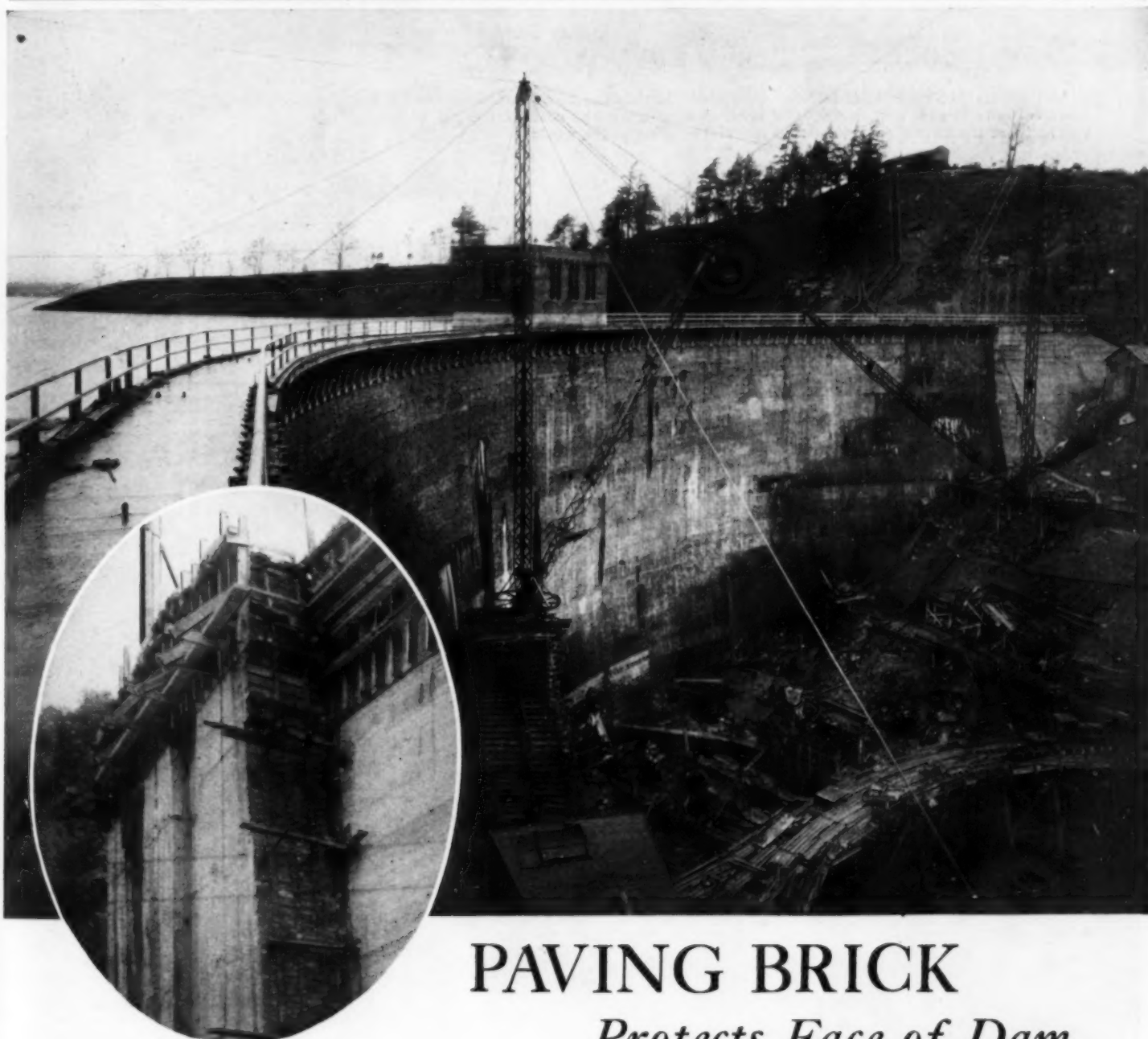
*A monthly pictorial of field practice and equipment illustrating successful construction, maintenance and material-handling methods for general construction, highways, buildings, industrial plants and public works and utilities*

WILLARD CHEVALIER  
General Manager  
ROBERT K. TOMLIN  
Editor

VOLUME 10

NEW YORK, JULY, 1928

NUMBER 7



## PAVING BRICK *Protects Face of Dam*

**V**ITRIFIED paving brick is the material that the Rochester (N. Y.) Gas & Electric Corporation has applied to the exterior surfaces of the Caneadea dam to protect the concrete from possible effects of weathering under wide variations of temperature. The brick facing

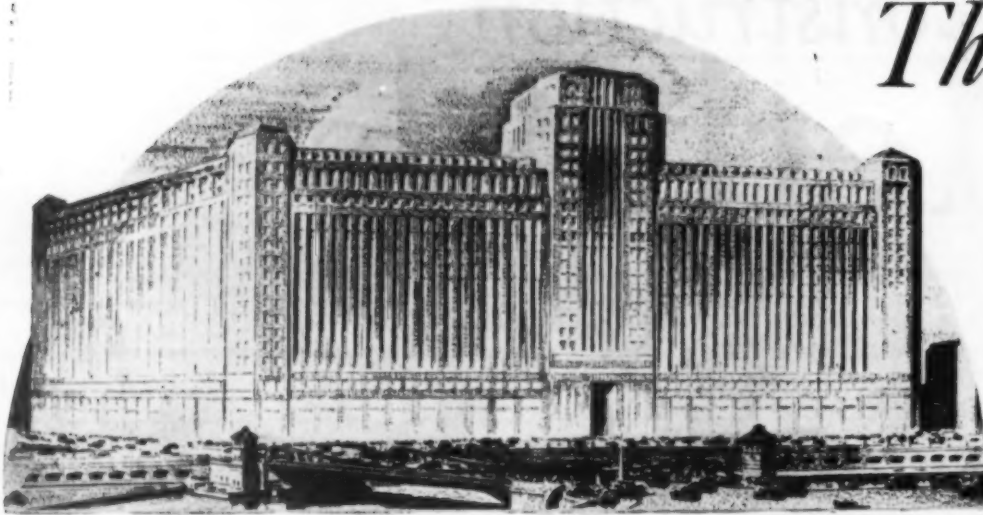
work, according to E. R. Crofts, chief engineer for the company, was done in the following manner:

A light wooden form was constructed and put in position. The brick was laid as headers and stretchers against it, allowed to set 36 hours, and the concrete was poured against the

header brick. This method was followed, according to Mr. Crofts, to prevent separation between the brick and the concrete. After the forms were removed the joints were raked and painted. A detail of the header and stretcher method of applying the brick surfacing is shown in the oval insert.



# This Month's



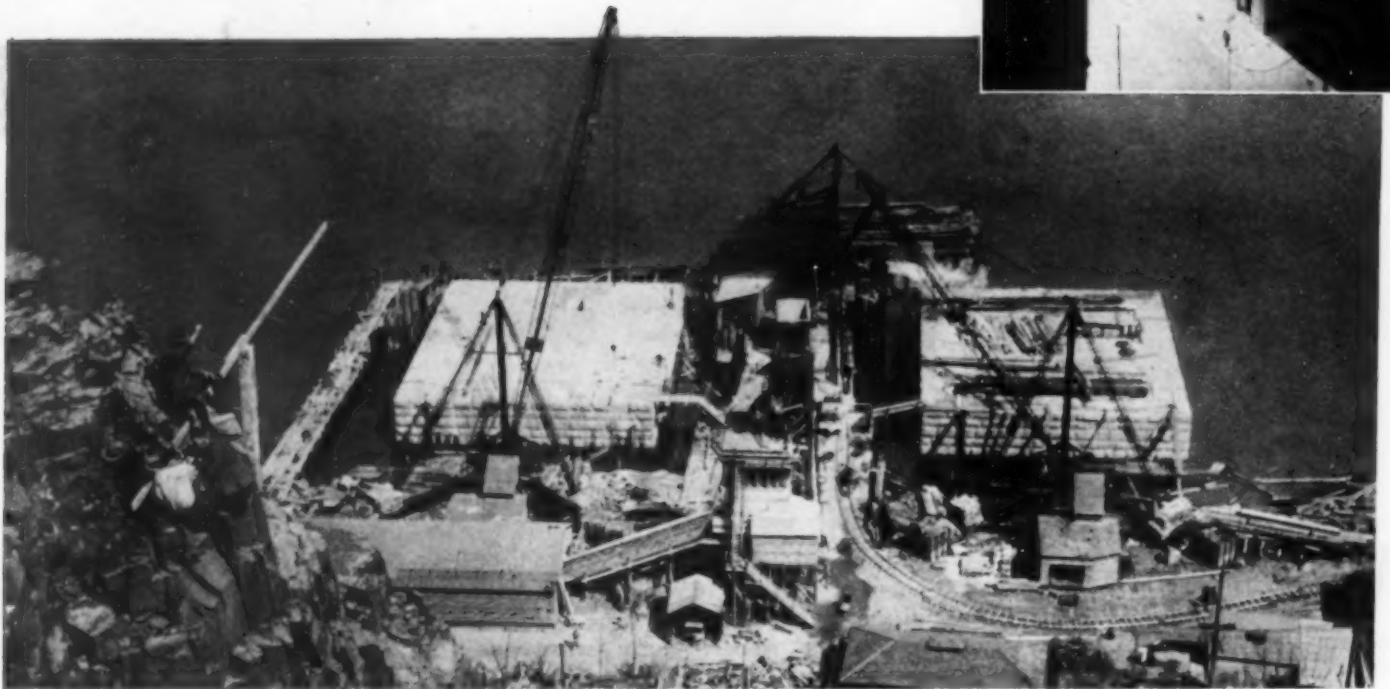
**BIGGEST BUSINESS BUILDING.** Projected Merchandise Mart in Chicago will cover two city blocks, contain 4,000,000 sq.ft. of floor space and cost \$30,000,000. It will be twice the size of any existing commercial building in the world.



**MUNICIPAL AIRPORT** (*above*), under construction at Oakland, Calif. Caterpillar tractors do the grading with McMillan one-man scrapers.



**THIRTY STORIES** (*right*) of San Francisco's newest skyscraper, the Russ Building, which contains a 400-car garage and 8 acres of floor space.



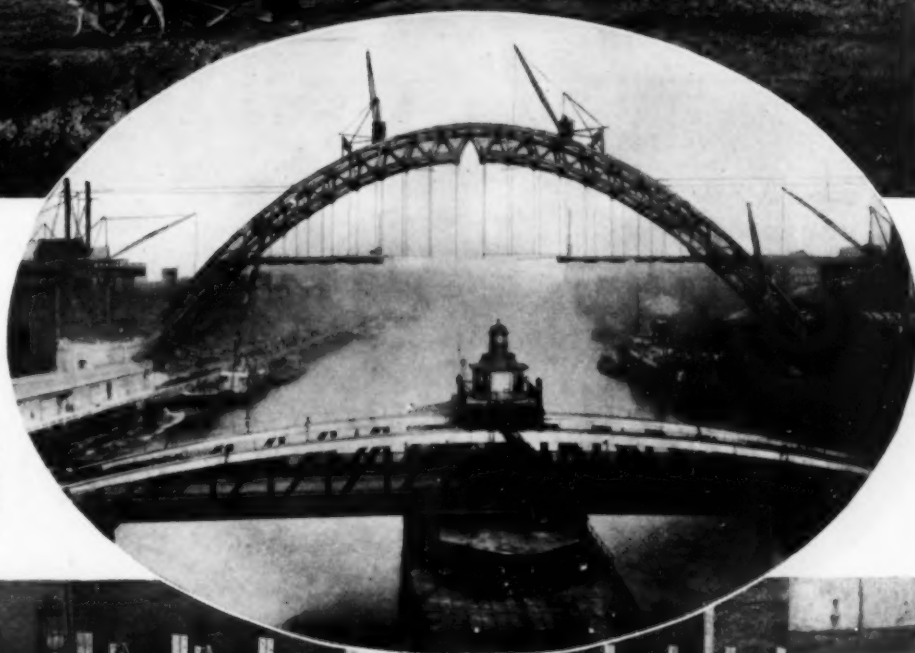
**BRIDGE PIERS** begin to take form for the huge span across the Hudson River between New York City and Fort Lee, N. J. The masonry substructure is being built by the Silas Mason Co., Inc.

's

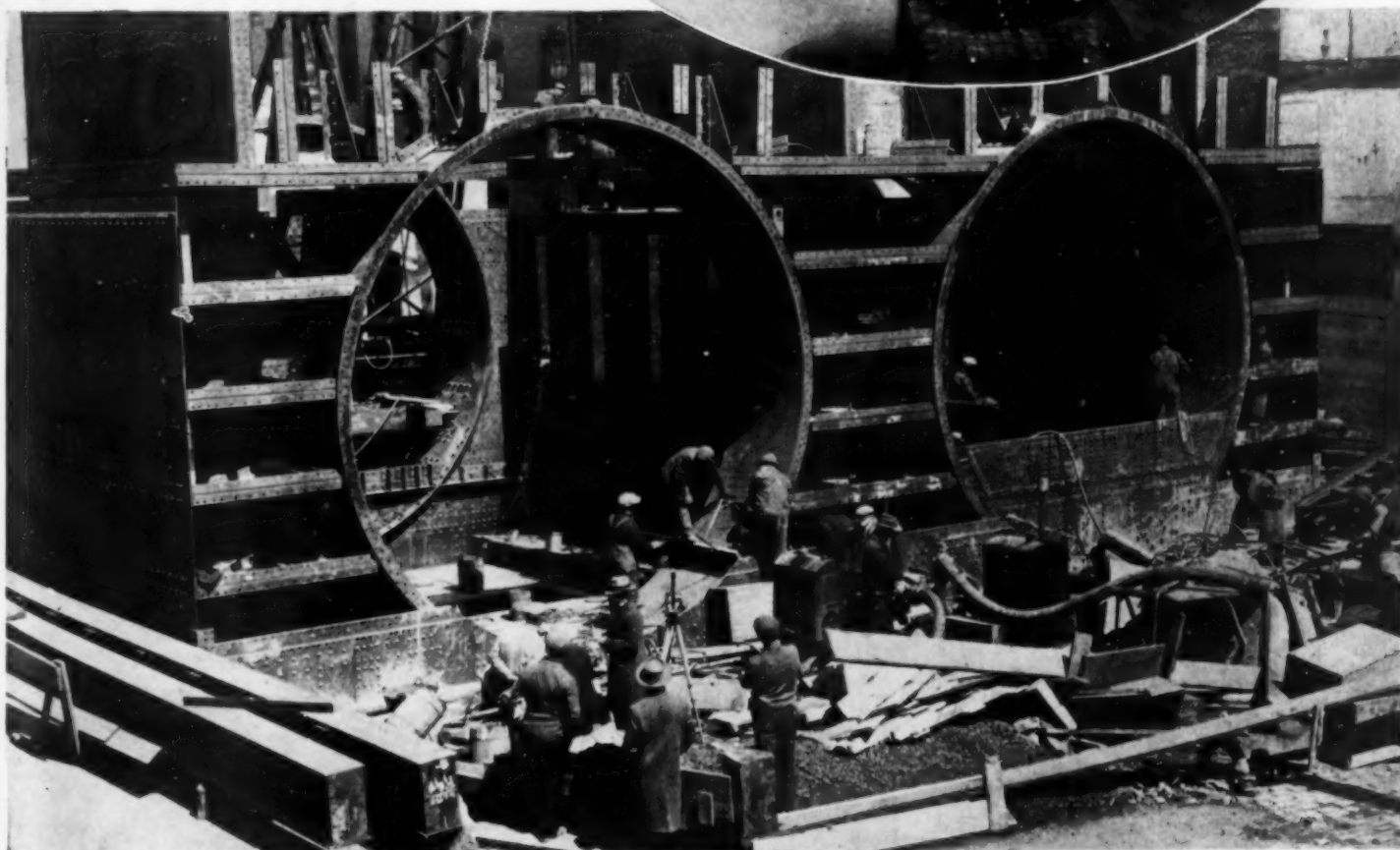
# "News Reel"



**EIGHT CENTS A CUBIC YARD!** (above) That's the cost of earth excavation with primitive scrapers, bullock and native labor on the Rice Canal in India, as reported by H. J. Ajwani, assistant engineer at Larkana, who forwarded the picture above. The Lloyd barrage and canal project, he states, will reclaim 6,000,000 acres.



**NEW TYNE BRIDGE** (right) linking Newcastle and Gateshead, England, will soon be opened to traffic. The arch has a span of 531 ft.; steel hangers carry the roadway. Dorman, Long & Co., Ltd., were the contractors.



©Int. Newsreel

**FOR BUILDING NEW YORK SUBWAY.** Steel caissons being fabricated prior to sinking at Fulton St. for East River crossing to Brooklyn. The general contractor for this section of the work is the Mason & Hanger Co.; the steel work is handled under a subcontract by the Dravo Contracting Co.





DREDGES, excavating blasted rock from the canal, deposited it in the stripped right-of-way on the other side of the old trail.



JAMES ALLEN (left), project engineer, and J. L. DELAMERE, superintendent for the R. C. Huffman Construction Company.

## *Drills, Dredges* Used by Contractors Across the

**C**ONSTRUCTION of the Tamiami Trail across the Everglades involved many new and difficult problems. Through 60 miles of uninhabited wilderness, covered with water for four months each year, machines had to be developed to drill and exca-

vate the lime rock which underlies the country at a depth of from 6 in. to 6 ft. Once the rock had been removed and dumped in the fill, there still remained the difficult task of working the mass of boulders and fine material down to finished grade. In solving these construction problems the equipment manufacturers proved of great assistance to the contractors.



SMALL SUCTION DREDGE followed the dipper dredge which removed the muck to widen the canal. Equipped with a 6-in. centrifugal pump, it cleaned the muck from pockets in the bed of the canal. Behind the suction dredge came the drilling outfit and the dipper dredges.





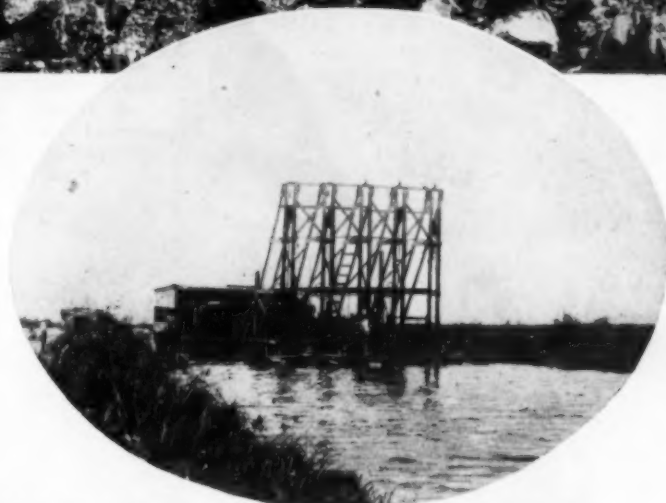


DRAGLINES and shovels were used to do the rough grading, leveling off the fill which had been built up by the dipper dredges.

## and Dynamite to Build Highway Everglades

Twenty-four miles of the Trail were completed by the R. C. Huffman Construction Company in time for the official opening on April 25. This section was built under two contracts. Work on the first of these was started in October, 1926, at a point 20 miles west of Miami. A solid rock-filled highway previously had been completed to this

point. Beyond, for the 24 miles to the Dade-Monroe County line, an attempt had been made to construct a road by throwing up a shallow fill on the muck overburden. A rough trail, impassable in the rainy season, was the net result. The Tamiami Canal paralleled the



THE DRILL BARGE carried five drifters, working in vertical leads spaced 5 ft. apart.



QUARTER BOATS were used to house the men on the Huffman Company's project.

DIESEL DRAGLINES (left) built the fill on the second 12-mile section.

highway for some distance beyond the 20-mile point.

The Huffman Construction Company's two contracts were each for a 12-mile section. Starting the first of these at the end of the completed highway, the canal was used to bring in floating equipment, and 12 miles were constructed with this type of machines.

On this section drilling was done with five Ingersoll-Rand R-72 drifters with slab back mountings which worked in vertical drill leads placed on the front of a barge. The leads were spaced 5 ft. apart. Three Ingersoll-Rand 10x8 compressors, an air receiver, a forge, and a Leyner drill sharpener were carried on the same barge. On the second section, where lack of water forbade use of floating equipment, a three-lead



OXEN were used by Alexander, Ramsay & Kerr, Inc., to haul supplies to the drilling and blasting crews. When even these beasts could not pass through the forest of stumps, a log-rail tramway was laid (page 26). As a last resort, men pushed the supplies on skiffs or pack them in on their shoulders.



A SKIMMER-SCOOP, leveling the fill, kept up with the three dredges.

drilling outfit of R-72 drifters was mounted on skids, with two compressors and a receiver on a separate sled.

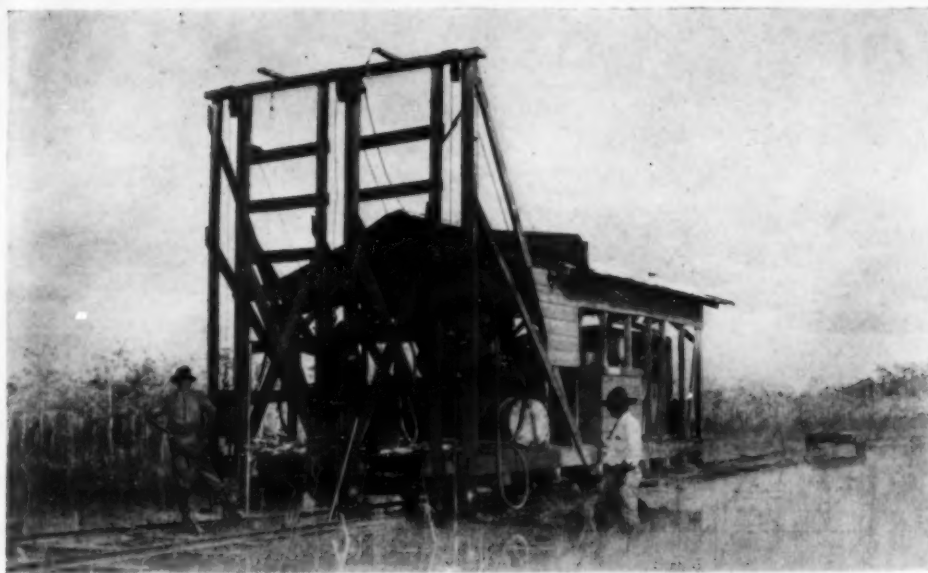
Both outfits drilled holes in rows from 4 to 10 ft. apart. The depth of the holes varied from 10 to 14 ft. In all places where the rock was hard, or where previous blasting had created fissures in the rock, 60 per cent nitroglycerin was found to be the most effective explosive.

On the drill barge, the drillers loaded the holes; but a separate loading crew followed the skid outfit, which could not be moved back and forth to allow shooting. All blasting was done by daylight. Shots were wired in series parallel and from 200 to 300 holes were fired at one time with a 1,500-watt Kohler light plant which furnished lights for the night drillers. The average amount of high grade explosive used was 70,000 pounds per mile or 3 lb. per cu.yd. of rock. Although a



THREE DREDGES excavated all the rock for the fill on this 43-mile section. Without walking and crawler dredges the work would have been abandoned.





THE DRILLING OUTFIT ran on rails. Track was built in sections to be moved ahead. Three drifters, in vertical leads, were spaced 4½ ft. apart. The carriage also mounted two 10x12 compressors and air hoists for the drills.

ton of explosives was being placed and fired each day, not a single accident occurred in prosecuting this phase of the work.

Three floating dipper dredges excavated the blasted rock and placed it in the fill. These were a 2-cu.yd. American Steel, a 1½-cu.yd. Fairbanks, and a 1-cu.yd. Bay City. One of the dredges removed the muck from the right-of-way while another stripped the width of canal to be blasted.

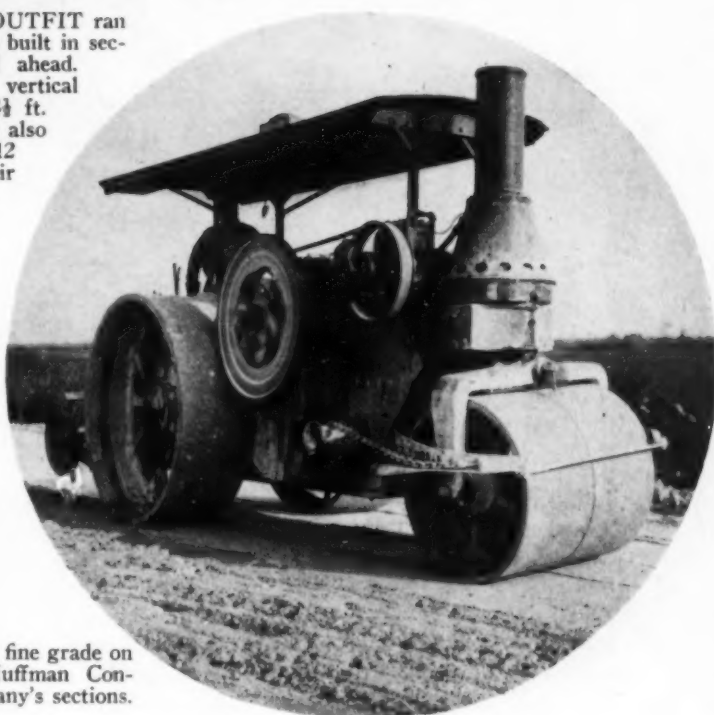
On the second section, excavating of the rock was done with three Bucyrus Diesel draglines. The machines proved very efficient for this work.

Grading of the fill followed quickly behind the excavating machines. It was necessary to have some kind of road open to move supplies to the active vanguard of the job. Shovel-draglines (3 Northwest, 2 Erie, 1 Link-Belt, 1 Thew) leveled the fill.

J. L. Delamere, superintendent was

in charge for the Huffman Construction Company. James Allen, project engineer, supervised operations for the State Road Department, under the direction of R. C. Fergus, division engineer, Fort Lauderdale.

Alexander, Ramsay & Kerr, Inc., built a total of 85 miles of highway in Collier County. Work was started in December, 1923. Regular weekly boat connection between Everglades, 4 miles south of Carnestown, on the Tamiami Trail, and Tampa, 325 miles away, was established. The 45 miles in rock from Carnestown east across the Everglades formed the most difficult section of the project. Rock lay close to the surface. The contracting organization had no precedent to guide it in designing equipment.

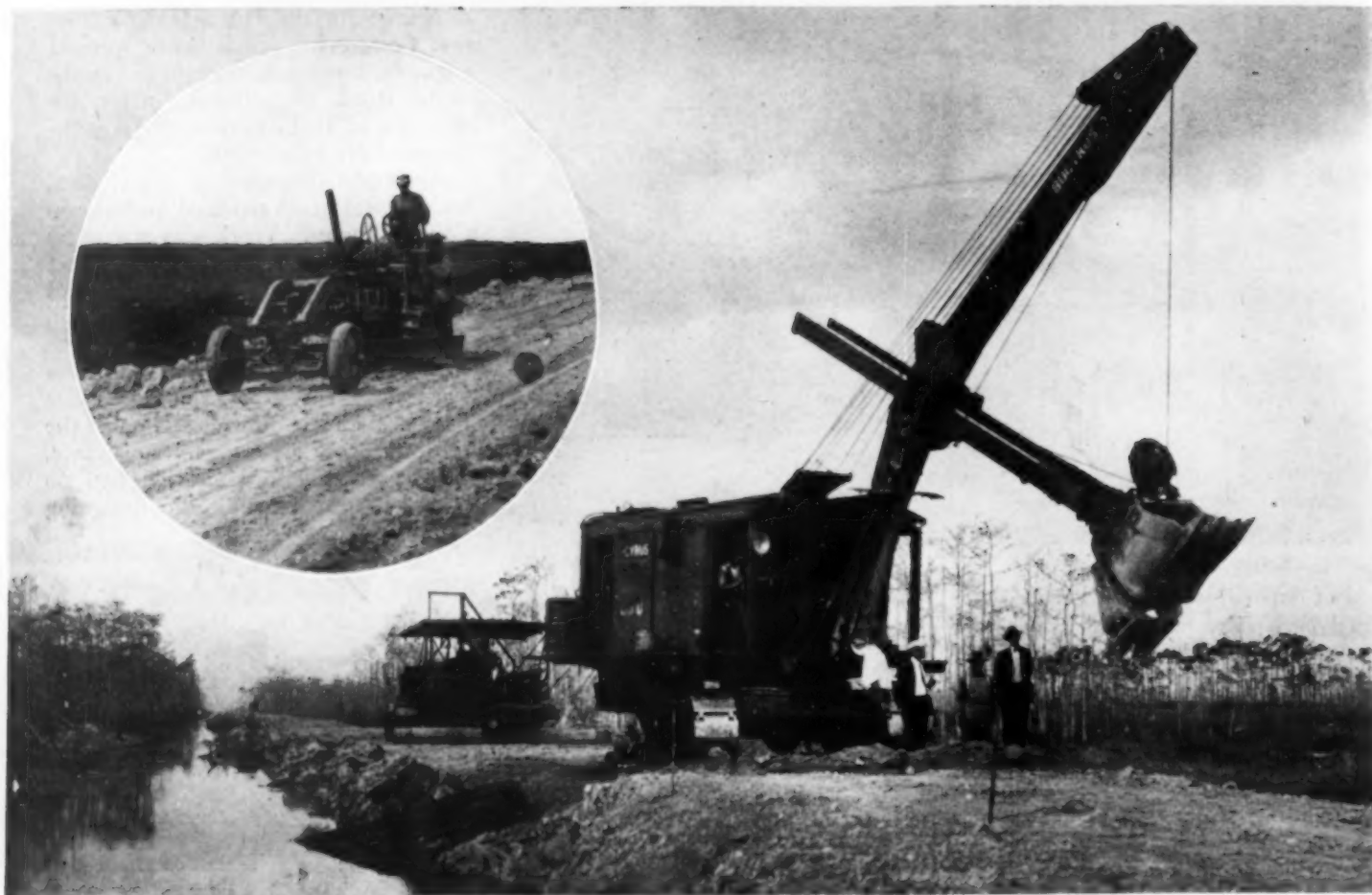


ROLLING the fine grade on one of the Huffman Construction Company's sections.



SPECIAL SCARIFIER YOKE, equipped with 3-in. square teeth and attached to heaviest grader frame, for working the top 1 ft. of the rock fill. The machine weighed 15 tons.





EXTRA LIP AND TEETH on the bucket door were used to scarify the fill on the Chevelier Corporation's section, no scarifier being available for this work. The shovel is pulling the single lead drill outfit over the finished grade. Rollers under the drill outfit are helping to compact the surface.

(Insert) FINE GRADING on a Huffman section.

When the hard rock east of Carnestown was first encountered, various methods were tried to drill it. None proved satisfactory, and the problem became serious. It was finally solved with the assistance of the Ingersoll-Rand Company by mounting three N-70 drifters in leads on a wheeled carriage. Three holes, 12 ft. deep and  $4\frac{1}{2}$  ft. apart, were drilled in a row. These rows were spaced 6 ft. apart. The rig drilled 88 12-ft. holes a day for 32 miles.

The charge varied from a minimum of 8 or 10 sticks of 60 per cent nitroglycerin to a maximum of 24 sticks. A total of 1,297,900 pounds of dynamite was used without a single fatality. The maximum average quantity of high grade explosive required to blast 1

cu.yd. of rock was  $2\frac{1}{4}$  lb. The average for the job was about  $1\frac{1}{4}$  lb.

D. Graham Copeland, chief engineer of the contracting company, says that without his Bay City walking dredges this section of the Tamiami Trail could never have been built. A floating dipper dredge was first tried. Work was about to be given up when a change was made to walking and crawler dredges of 1-cu.yd. capacity. Three dredges excavated all the rock from Carnestown east. Working 18 hours a day and building the spoil bank for a road averaging 5 cu.yd. to the running foot, they advanced in one month  $2\frac{1}{8}$  miles and made average progress for two years of  $1\frac{1}{8}$  miles a month.

A Bay City skimmer-scoop leveled the fill. Working 24 hours a day it

kept up with the three dredges. There were 3 Bay City skimmer scoops on the job.

To work the heavy material in the fill, special equipment was required. The Austin Western Road Machinery Company was called into consultation and after some experiment developed a scarifier with a built-up yoke and 3-in. square steel teeth. Attached to the company's heaviest grader, this scarifier worked the surface to specified fineness.

Mr. Copeland was in general charge for Alexander, Ramsay & Kerr, Inc. C. G. Washbon, supervising engineer, had charge of field operations, while H. W. Bristol, industrial engineer, managed the shop at Port DuPont and the supply base at Carnestown. For the State Road Department, Henry Wilson, division engineer, Punta Gorda, exercised general supervision. E. C. Binkle was project engineer.

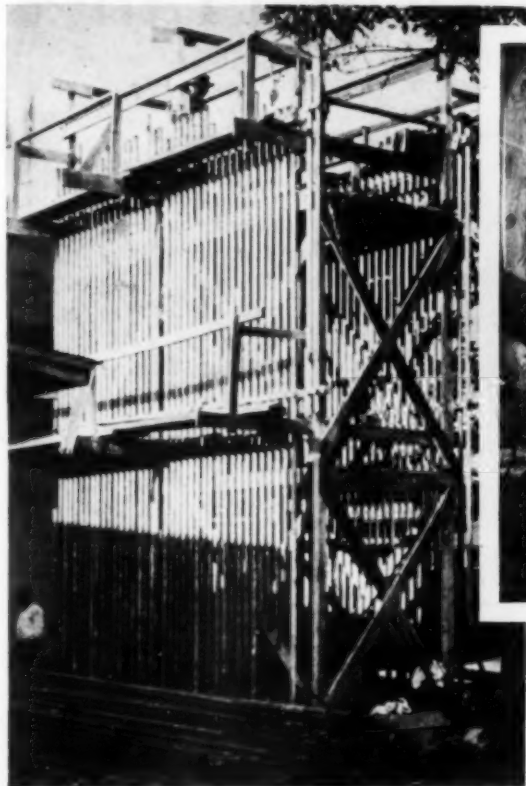
A southern loop of the Tamiami Trail was built through Monroe County. Of the total length of approximately 23 miles in this loop, 16 $\frac{1}{4}$  miles was constructed by the Chevelier Corporation under the direction of Erben Cook, superintendent of construction.



THE ROLLING CAMPS of Alexander, Ramsay & Kerr were kept close behind the dredges as the work advanced.

# Cement Lining for Small Pipe

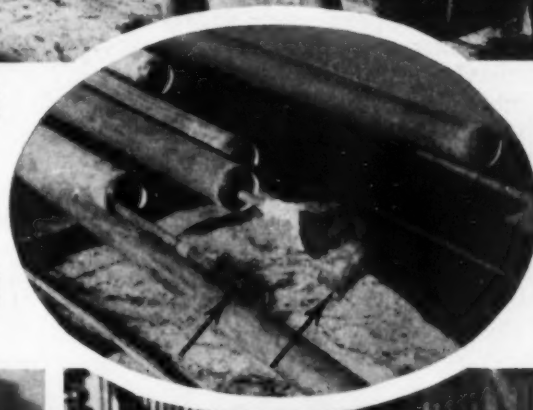
*As practiced by the West Palm Beach (Fla.) Water Company*



THE PIPES are set in a scaffold. Mortar is poured in the pipes at the top.



BOTH OLD AND NEW pipe must be thoroughly cleaned before being lined.



A FLUE BRUSH and a rag swab (in oval) are the tools used for cleaning the pipe.



TWO BRASS TORPEDOES are pulled through the pipe by hand. The connecting cord is chalk line.



THE SECOND TORPEDO leaves a 1/4-in. lining. This torpedo enters the pipe at the bottom just before the first one is pulled out at top. (In circle) A SECTION of lined pipe.



W. D. LOCKLEER, JR., chief engineer of the pumping station, who developed the method used at his plant.



# Trussless Roof for Democratic Convention Hall

**U**NDER a general contract specifying a penalty of \$3,000 a day, and a sub-contract for the roof with a penalty of \$500 a day for failure to complete work on time, speed was an all-important factor in building the huge hall for the Democratic National Convention which assembled at Houston, Texas, last month.

The design provided for a timber structure, 325 ft. long, 270 ft. wide and 60 ft. high, to seat 20,000 delegates. The hall consists of a central bay 120 ft. wide between columns and two side bays each 76 ft. wide. A feature of the structure is the Lamella "woven wood" trussless roof covering an area of approximately 85,000 sq. ft. The center span required 2,000 "Lamellas" or ribs in the form of 3x14-in. timber pieces 12 ft. long, weighing 150 lb., each milled to special shape and bored with holes at ends and centers for bolted field connections. For each side bay roof 1864 Lamella ribs 2x10 in. by 9 ft. were used. The thrust of the roof is taken up by steel tie-rods.



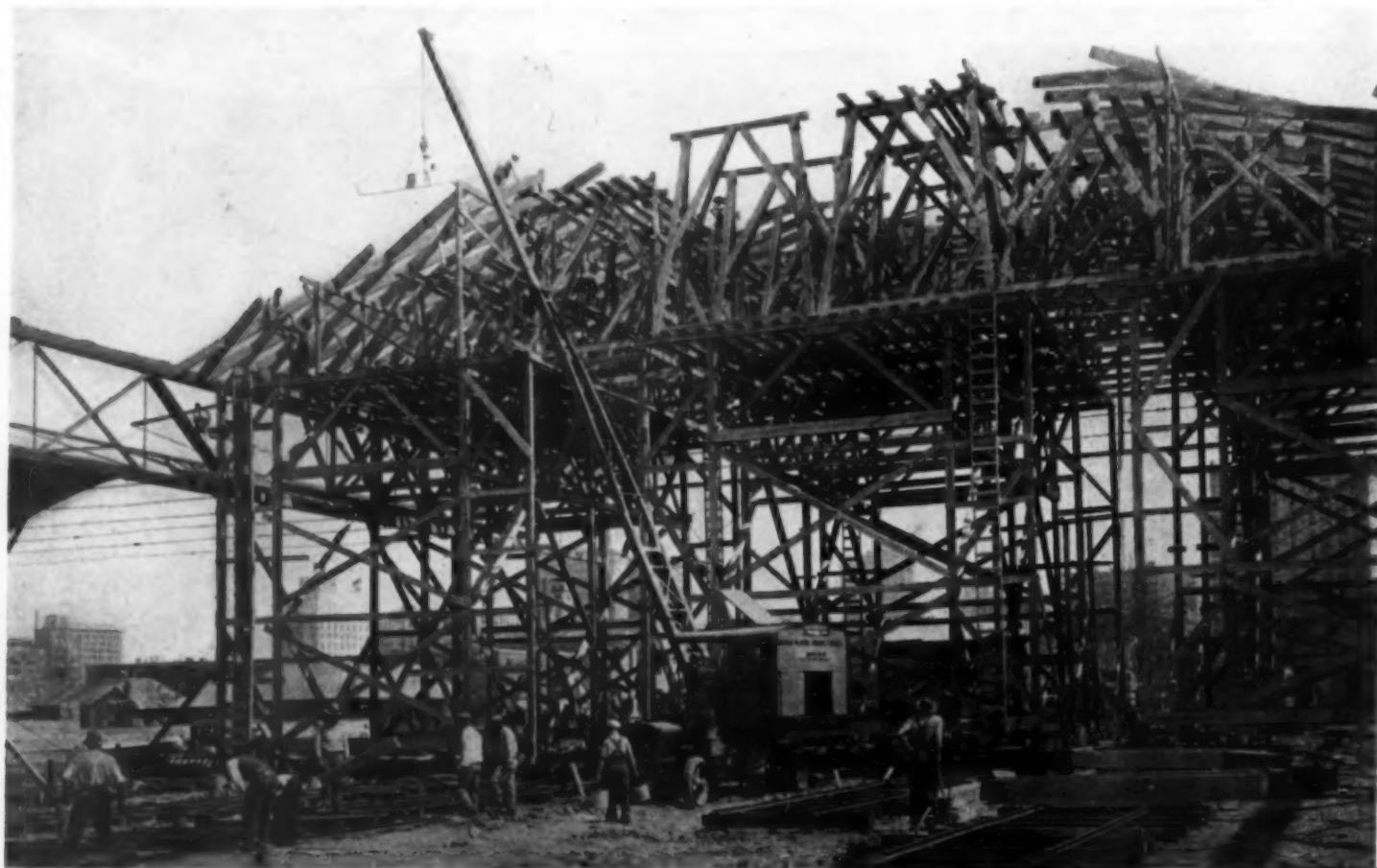
WOVEN WOOD ROOF structure, with "Lamellas" or ribs connected by bolts and spring washers.

Less than two weeks before the Universal Construction Co., of Houston, began construction of the convention hall the site was covered by a group of

negroes' shacks. These were quickly removed and grading operations begun. On March 6 the roofing sub-contract was placed with the Lamella Trussless Roof Co., of Houston, which immediately issued a rush order to the Kirby Lumber Co. for the necessary lumber. The subcontract called for completing the roof in 45 days; the job was actually finished in 22 days, of which only 9 days were needed for the Lamella construction.

In erecting the roof the sub-contractor introduced a special form of scaffolding. It consisted of five movable platforms, each 30 x 50 ft. in area and mounted on six pairs of railroad car wheels running on a pair of standard gage tracks. Three of these scaffolds for the center span were 36 ft. high and the other two, for the side bays, 26 ft. high. Movable wooden horses were mounted on the scaffold platform to reach the elevation of the roof surface.

The wooden roof members were delivered to the erecting crew by a Uni-



SPECIAL SCAFFOLDS, 36 ft. high and mounted on railroad car wheels, carried 30x50-ft. platforms and wooden horses on top to which lumber was raised by a Universal crane with boom extended to 55 ft.





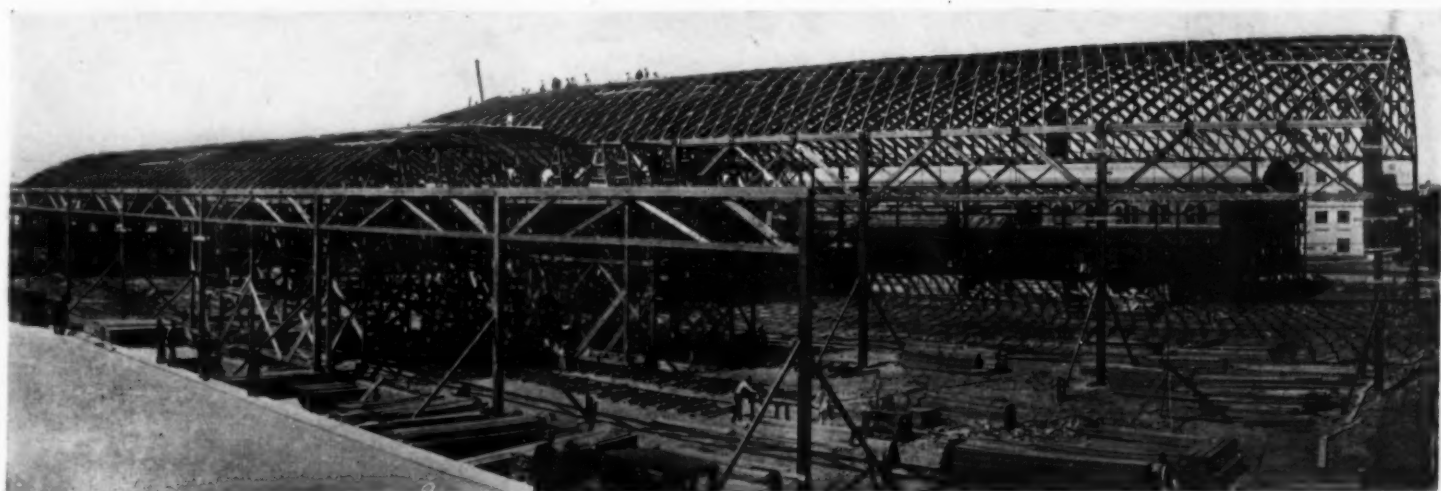
CENTRAL BAY has roof span of 120 ft.; it is flanked by side bays with roof spans of 76 ft.  
Hall will seat 20,000 Democratic delegates.



TOP VIEW of Lamella roof construction, showing how ribs are interlaced and bolted through holes bored in ends and centers.

versal crane with boom extended to 55 ft. by an 8x8-in. timber, as shown in the picture on the front cover of this issue. This crane was a 6-ton unit on a White truck chassis, furnished by the Coffman-Werner Crane Service Co. For the interlaced members of the Lamella roof structure 140,000 board feet of lumber were required and for the roof sheathing material 120,000 board feet.

The convention hall was designed by Kenneth Franzheim, architect of New York, and construction was supervised for the City of Houston by R. J. Cummins, consulting engineer, and W. A. Dowdy, city architect. For the general contractor J. A. Barry, vice-president, was in charge; for the roof sub-contractor George L. Kelly, general manager, directed the work.



ROOF STRUCTURE, designed by W. Klingenberg, nearing completion, showing column and longitudinal truss supports. Thrust of roof is taken by steel tie-rods.



H. R. LANE,  
superintendent of erection.

# Step-by-Step Glazing Operations

BY DIVIDING the process of setting glass into its simple steps and assigning these operations to individuals in the glazing crew, the Charles Haas Company of Cuyahoga Falls, Ohio, was able to make remarkable progress in erecting the glass panels of the monitors on the Chevrolet assembly plant at Atlanta, Ga. Starting the work with a green crew, H. R. Lane, superintendent of erection, faced the necessity of quickly training his men to become fast workers. The various operations of glaz-



1 THE GLASS PANELS were hoisted to the roof and placed in crates along the alleys.



2 TWO MEN were assigned to setting the storm panels.



3 THEY CLIPPED the six storm panels and faced the edges covered by the swinging panels.



4 TWO MEN BEDDED the rest of the panels, one puttingty the upper half and the other, the lower half.



# Field Methods on a Factory Building

ing were distributed among the men, each workman performing only one step. By specializing in this way, the men soon became speedy and efficient workers. Exclusive of the laborers who placed the glass panels within convenient reach of the glaziers, the crew comprised but twelve men. These dozen workers set 12,600 sq.ft. of glass every 9 hours. In addition to the nine glaziers shown at work in the pictures, a second crew of three men was kept busy facing the panels.

C. C. SHANNON,  
glazing superintendent.



5 THE PANELS were placed in convenient position to be set. One man set all the glass and cleaned the excess putty off the under side.



6 CLIPPING was done by one workman.



7 TWO GLAZIERS worked together at facing the upper half of the panels.



8 FACING was completed by a single workman.

# Members Welded Into



ARC WELDING was done with two 200-amp. single-operator motor-generator units.

**W**ITHOUT a rivet or a bolt in any of its members the single-track bridge, 180 ft. long, which carries the Boston & Maine Railroad over a power canal at Chicopee Falls, Mass., is the first railroad bridge in the world to be erected by the arc-welding process. It was built by fusing the various members together at their joints by means of the intense heat of the electric arc. The bridge is, therefore, actually a one-piece structure.

It was constructed for the Westinghouse Electric & Manufacturing Company, with the co-operation and approval of the Boston & Maine Railroad, to serve the local Westinghouse plant. The Palmer Steel Co., of Chicopee Falls, fabricated the steel and did the welding, and Tarbell & Leete, also Chicopee Falls, erected the foundations and steel work.

**Steel Tonnage Saving 33%**—The outstanding advantage secured by the use of arc-welding, according to Gilbert D. Fish, consulting structural engineer for the Westinghouse Electric & Manufacturing Co., is a saving of approximately 33 per cent of the tonnage of steel required. This saving is secured in two ways: In the first place, the sizes of many of the truss members, connecting parts, and floor stringers have been reduced and yet provide strength equal to that of an equivalent riveted job because there is

no weakening due to rivet holes. Secondly, a considerable amount of connecting parts and lattice bars, which would be needed for riveting, have been omitted.

At the point where the bridge crosses, the power canal is approximately 50 ft. wide, but owing to the extreme angle of 72 deg. required to provide access for the railroad siding to the plant each of the bridge trusses is 135 ft. long and the overall length of the bridge is 180 ft. The structure is approximately 25 ft. high center to center of top and bottom chords and is 17 ft. wide center to center of trusses.

The bridge was designed exclusively for arc welding and as a result the steel tonnage required, according to A. M. Candy, of the general engineering department of the Westinghouse company, is only 80 tons, whereas a corresponding design made by railroad engineers for a riveted bridge required 120 tons of steel. The connecting material for the welded bridge, according to Mr. Candy's figures, is only about 5 per cent of the weight of the structure, whereas the connecting material re-



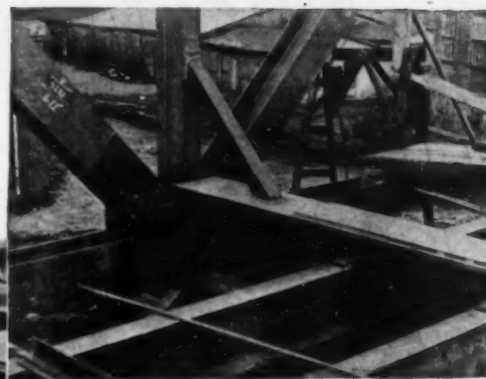
FLOOR BEAMS of 21-in. I-beams are reinforced by top and bottom cover plates. Stringers are 12-in. I-beams designed for continuity.



# "One-Piece" Bridge

quired for the corresponding riveted design ran almost 30 per cent of the weight of the structure.

**Welding Details**—Two single-operator 200 amp. Westinghouse motor-generator arc-welding units were used for shop fabrication and later transferred to the site of erection to do the field welding. All bridge members were bolted together on cribbing on the canal bank, after which operators proceeded to complete the welding. After



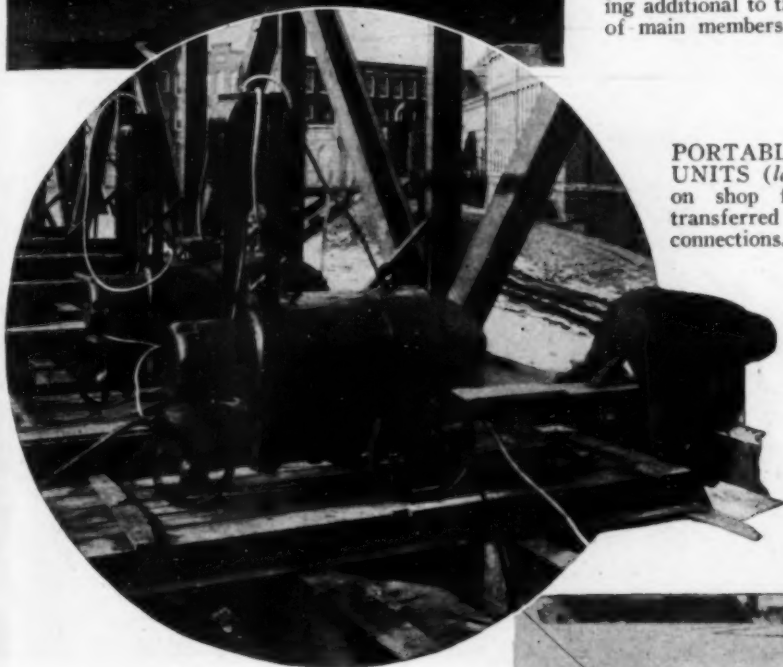
**KNEE BRACES** (above) welded between posts and floor beams add strength and stiffness to structure.



**STRINGER CONTINUITY** (above) is obtained by welded plates extending through slots cut in webs of floor beams.



**SLOTS** (left) in gusset plates at main panel points provide for welding additional to that done at edges of main members.



**PORTABLE WELDING UNITS** (left), after service on shop fabrication, were transferred to duty on field connections.

placed through these slots to lie over the ends of the two adjacent stringers; these plates are bars  $\frac{3}{4}$  x 4 in. by 1 ft. 6 $\frac{1}{2}$  in. long. Welding is done along the edges of these bars so as to develop the full strength of the top flange of the 12-in. I-beam stringers. The I-beams are supported on the bottom flanges of the floor beams on filler blocks 7 in. long on top of which are located bars  $\frac{3}{4}$  in. thick, 6-in. wide and 7-in. long, to which the stringers were bolted for the field erection work.

Novel construction is used at points where gusset plates are required at the main panel points. Slots are cut in the gusset plates to provide for additional welding over and above that made possible at the edges of the main members where they overlap the gusset plates. In this way the requisite strength for carrying the stresses through the panel points is obtained with gusset plates much smaller than would have been required were the slots omitted.

The bridge was formally opened March 14, at which time a large number of representative engineers from many points in the eastern part of the United States inspected the project.

the bridge was completed, the canal was drained and cribbing was placed in it. The bridge was then moved lengthwise to place on its abutments.

Floor beams are 21-in. 120-lb. Carnegie beams, reinforced by top and bottom cover plates welded in position as a part of the shop fabrication work. The main members of the truss are likewise Carnegie beam sections. Stringers are 12-in. I-beams designed for continuity, which is obtained by having slots cut through the webs of the floor beams immediately above the top flanges of the stringers. Plates are



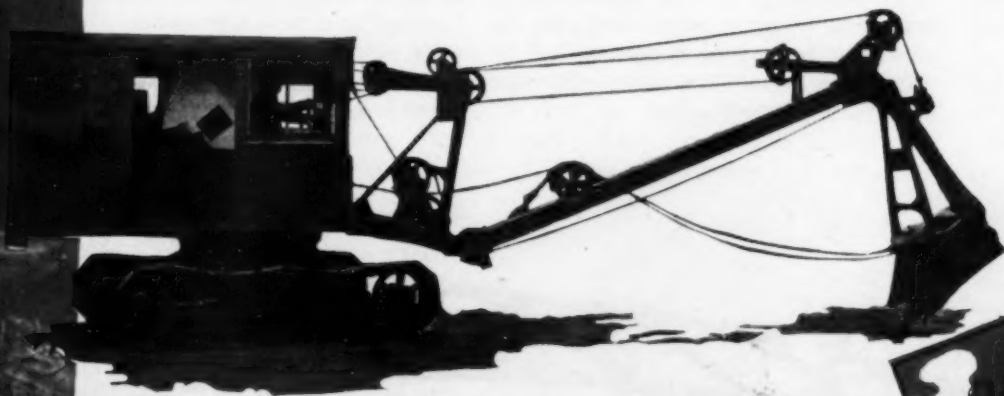
**BRIDGE MEMBERS** were bolted together on cribbing on canal bank prior to arc-welding; then structure was moved to place across canal.



# NORTH W



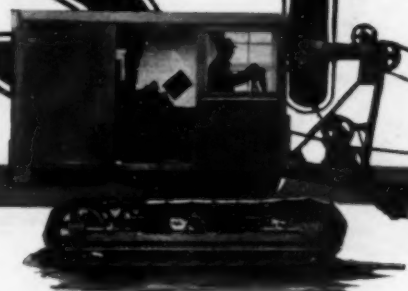
# 1 1/2 yard SHOVEL CRANE DRAGLINE PULL-SHOVEL SKIMMER-SCOOP



Nor  
W

free:

Ask for this interesting magazine! It's full of pictures of jobs just like yours. Tells what others are doing—fill in the coupon.



CM7 Gray

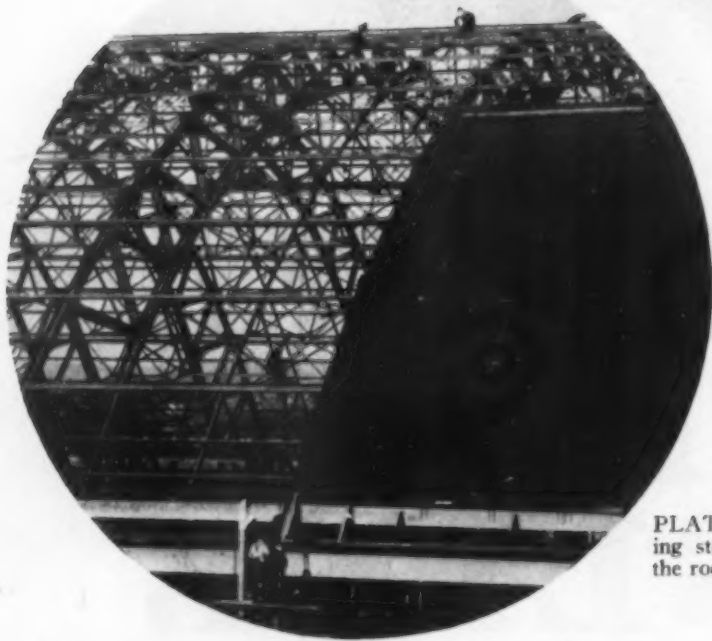
West Engineering Co.  
Geiger Bldg., Chicago, Ill.

Interested in (kind of work).....

and the "Illustrated"

# ARCH TRUSSES

## *Form Frame of Field House*



PLATES of copper-bearing steel were clipped to the roof purlins.

**T**HE field house recently completed at the University of Minnesota is an enormous building, 446 ft. long by 236 ft. wide and 107 ft. high from floor to arch of ceiling. Fourteen steel arch trusses, which form the main frame of the structure, are inclosed in brick walls and an insulated steel-plate roof. The great building will house the indoor athletic games of the university and, also, will afford practice grounds for open-air sports in bad weather.

The fourteen steel arch trusses are of the three-hinged type, with a pin-

point span of 220 ft. and a vertical distance from the  $4\frac{1}{2}$ -in. bottom pins to the  $7\frac{1}{2}$ -in. top pin of 100 ft. Each truss has its back post vertical to a height of approximately 43 ft. Truss members, both chord and web, are Bethlehem shapes, H, G and I sections, all 12 in. in depth but varying in weight from  $28\frac{1}{2}$  to  $119\frac{1}{2}$  lb. The uniform depth made simple gusset plate connections possible. At the bottom, each truss rests on a cast steel base bolted to a concrete footing 12 ft. square by 4 ft. deep. The trusses are spaced approximately 30 ft. apart.

The 2,300 tons of steel for the structure was fabricated by the Minneapolis Steel & Machinery Company and was erected by Walter De Freres, St. Paul, for the general contractor, the Madsen Construction Company of Minneapolis. Three steel stiff-leg derricks were used by the erectors in placing the great trusses.

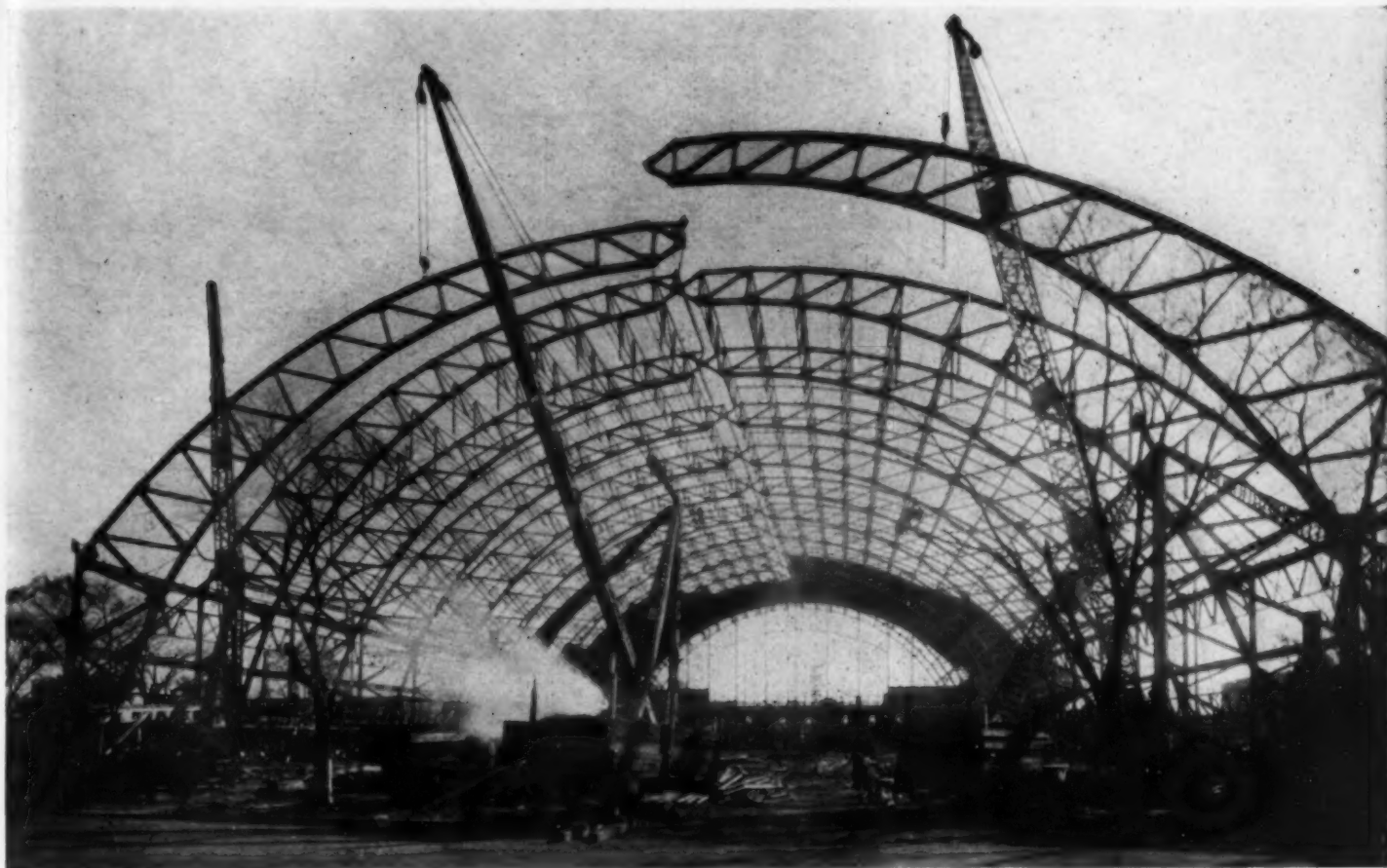
The main trusses were delivered to the job with each half in four pieces. These halves were riveted into two sections on the ground, the joints being made on a line level with the top of the back post. The bottom section was lifted, pinned to the base and properly blocked and guyed. One derrick boom held the first part while a second derrick lifted the upper section and supported it until connections were made. While these two derricks were thus occupied, a third assembled the sections of another half truss on the ground.

Over 2,500,000 brick went into the walls of the building. The free-standing end walls are stiffened by 36-in. plate-girder columns anchored in concrete footings and tied together at the top with steel wall trusses. These wall trusses are connected to the main arch trusses by deep purlin trusses. The



DRIVING THE TOP PIN of the last arch. The arches are connected by longitudinal trusses between panel points.





THREE STEEL stiff-leg derricks erected the arch trusses. While one derrick held the first half truss in place, the two others raised and set the sections of the second half.

Madsen Construction Company used pole scaffolds for laying the brick in the walls.

The main framing for the roof consists of longitudinal trusses between the panel points of the main arch trusses. These longitudinal trusses carry 8-in. channel purlins at their third points and these channels in turn support 5-in. channel purlins spaced approximately 5 ft. apart. Alternate bays of the main trusses are braced at the upper chord with diagonal bracing. A roof of copper-bearing steel plates is clipped to the purlins. These plates were curved at the factory to fit the radius of the roof.

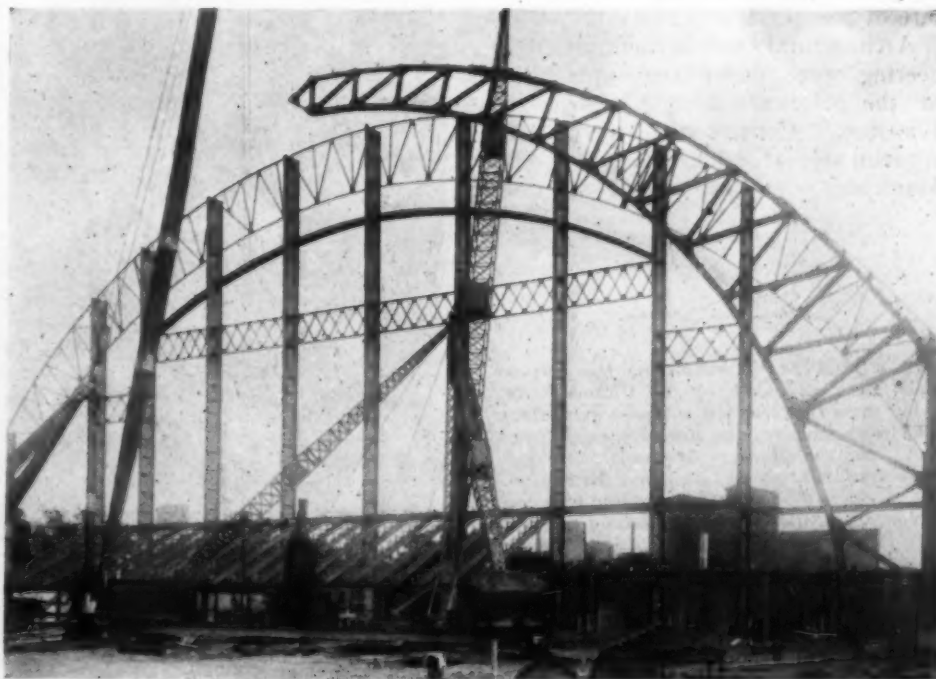
A 1-in. thickness of patented insulation was mopped over the steel plate roof to prevent heat loss by radiation. The insulation was then covered with a layer of 15-lb. felt, lapped 3 in. After another mopping, black slate-surface asphalt roofing felt was applied with a 17-in. selvage, solid mopped. Each layer of the felt as it was laid was fastened through the steel decking by screws, one to each 5 sq.ft. This fastening is intended to prevent sliding of the roofing on the curved parts during warm weather. The total dead load of the roof is only 6 lb. per sq.ft. An area of 126,000 sq.ft. was covered.

On each side of the building a double-deck balcony extends out from the side

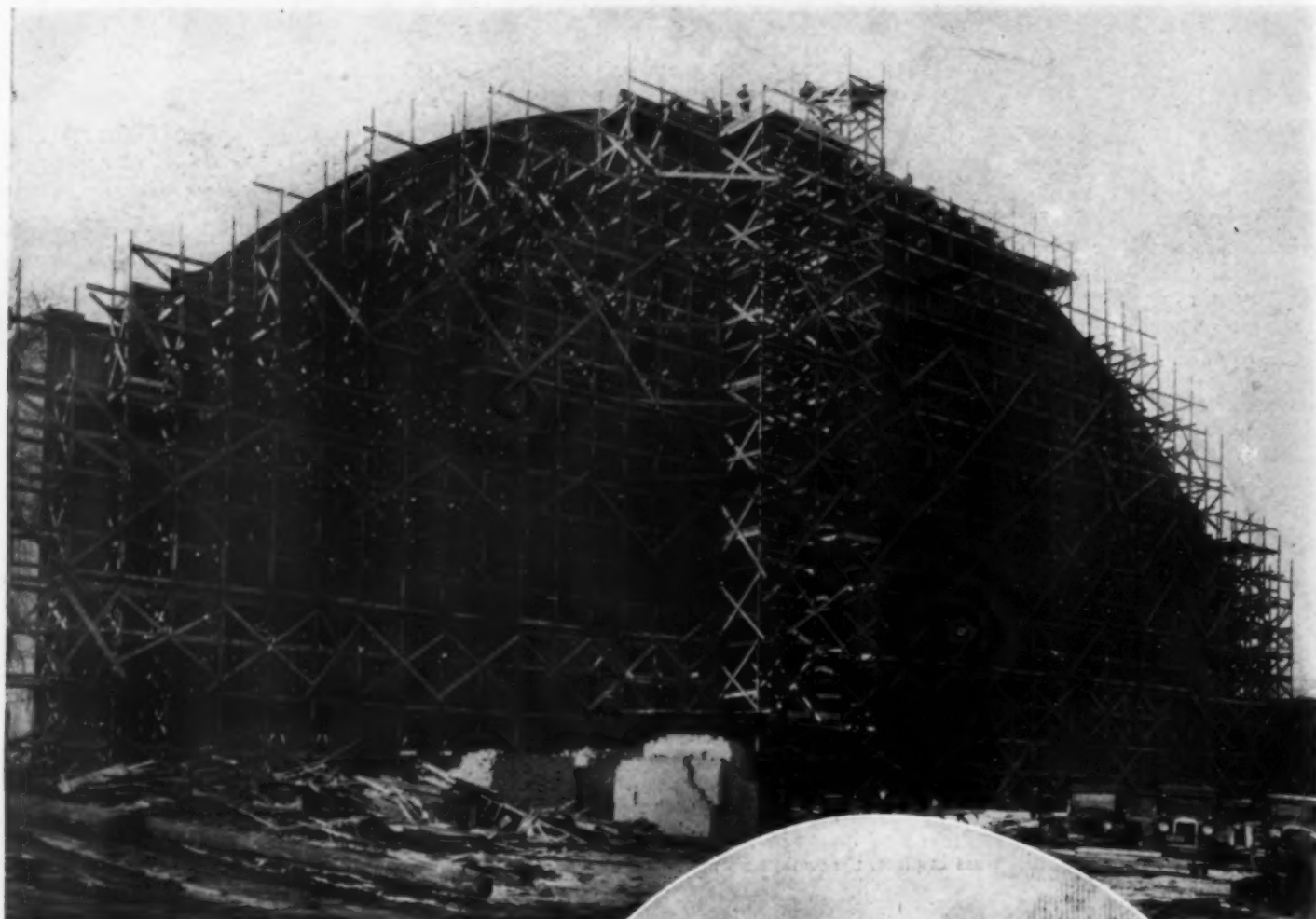
walls approximately 35 ft. Only two-thirds of the balcony were included in the Madsen contract, the construction of the remaining third being left for some future date. The side balconies are entirely supported on the arch trusses. They are carried at the rear on I-beams connected to the back posts

of the trusses. At the front, the balconies cantilever over parallel chord trusses carried by the inner chord of the arches.

Permanent seating arrangements as at present installed will accommodate 9,500 people. Temporary bleachers can be erected to take care of 6,000 ad-



THE FIRST HALF of the truss was held by one derrick while the second half was being erected by the two others.



A TRELLIS of scaffolding carried the bricklayers to the top of this end wall.

ditional spectators. With complete seating facilities installed, the ultimate capacity can be increased to 30,000 by using extra portable seats when the nature of the spectacle permits.

Architectural and structural engineering were under the supervision of the state architect, Clarence H. Johnston. Construction work was superintended for his office by W. B. Marschner.

NEXT MONTH: Constructing the Starved Rock Lock and Dam on the Illinois River, a big mass concrete job within a cofferdam. The work involves the use of special forms and concrete-placing methods. Woods Brothers Construction Company, the contractor, developed an effective movable belt conveyor rig, 72 ft. long, for handling concrete into forms after delivery from a large central mixing plant by 2-yd. industrial cars equipped with hopper-bodies and discharge spouts.

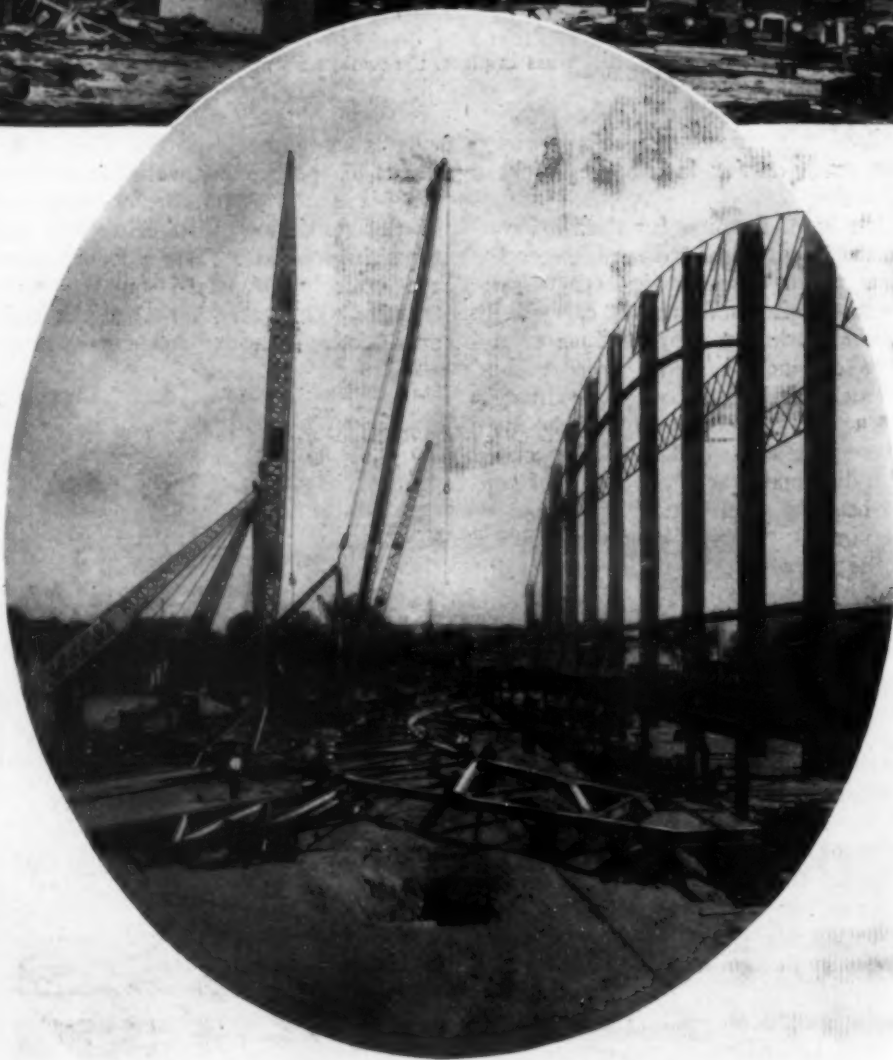


PLATE GIRDER COLUMNS, anchored in concrete at the foot and connected by trusses at the top, stiffen the free-standing brick end walls.





ADAPTATION of finishing machine to work below curb level, with special plow blades at ends of screed.

## Machine Finish for Base Below Curb Level

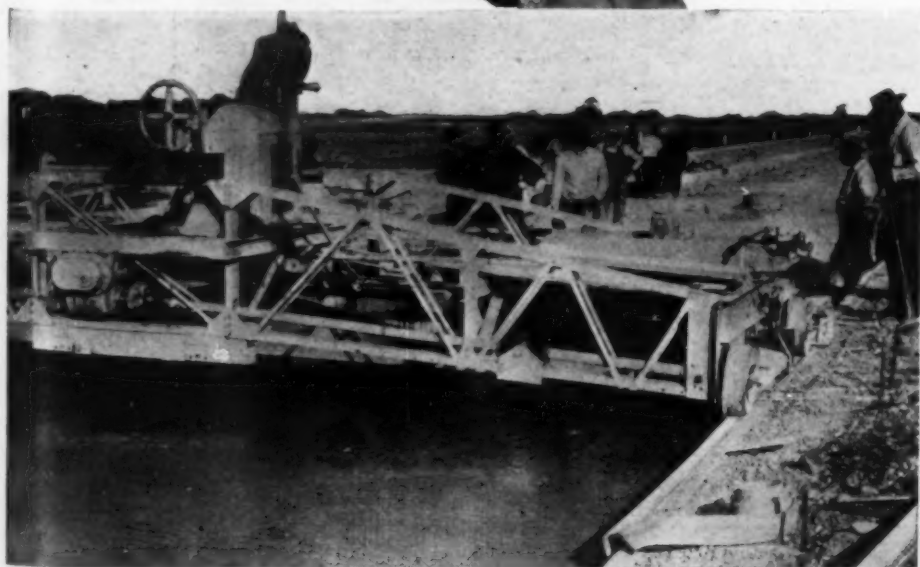
**I**N putting in a 9-in. concrete base for 65,000 sq.yd. of asphalt pavement 24 ft. wide in Cleveland, Ohio, the Ohio National Pavements Company used a Lakewood finishing machine specially adapted by the manufacturer to tamp and screed at an elevation  $8\frac{1}{4}$  in. below the tops of sandstone curbs on which the wheels of the finishing machine rode. To hold the curbs from overturning and prevent breakage or chipping, steel angles on rubber belt cushions were laid to form the track for the wheels of the finishing machine. To these angles were attached iron straps through which pins were driven into the ground to anchor the curbs.

The stroke of the screed, operating below and between the curbs, could not cover the full 24 ft. width of the base so that special plow blades were attached to each end of the finishing machine to prevent a ridge of concrete forming at the curb line.

At street intersections, most of the concrete was finished by hand. The machine was taken across an intersection by running it on special false forms which were designed by the contractor so that the machine could be run directly off of the curb on to these false forms, across the intersection, and on to the curb again when it reached the other side.

For the contractor George G. Mertens was in charge as superintendent.

ANGLE IRON TRACK (left), on rubber belt cushion, is anchored by straps and pins to protect curb and prevent overturning.



RUBBER BELTING cushion under angle-iron track protects curb from chipping by finishing machine with flanged wheels.

# OPEN CAISSONS *In Treacherous Ground*

UNSTABLE ground conditions and the presence of quicksand and water forced R. M. Johnsen, superintendent for The Foundation Company, to adopt a number of methods in sinking shafts for the piers of the Keystone Athletic Club Building in Pittsburgh last winter. Sixty-one piers were carried 3 ft. into bedrock, at a depth 60 ft. below curb. The piers were small in size, diameters ranging from 3 to 6 ft.

The original plan to use telescopic steel shells in sinking the piers had to be abandoned because the rings could not be kept plumb in the treacherous

ground. Most of the holes were sheeted with lagging driven from the surface as the excavation went down. Small holes were started 1 ft. over size and were driven approximately 30 ft. They

then were driven to size for the remaining distance. On three of the larger piers drop caissons were used very successfully. Because of the small size of the wells, steam siphons had to be used.



A 10-FT. SECTION of 2-in. sheeting for drop caisson.

DRIVING LAGGING (in oval) with an air hammer.

DROP CAISSON (right) with 6-ft. working chamber.



LAGGING, driven from the surface, formed the walls of most of the caissons. Two are indicated by arrows. The steel shells at the right were discarded. Wood flumes carried water from siphons to streets.



nd

main-  
larger  
y suc-  
ize of  
used.



2" Sheeting left in place

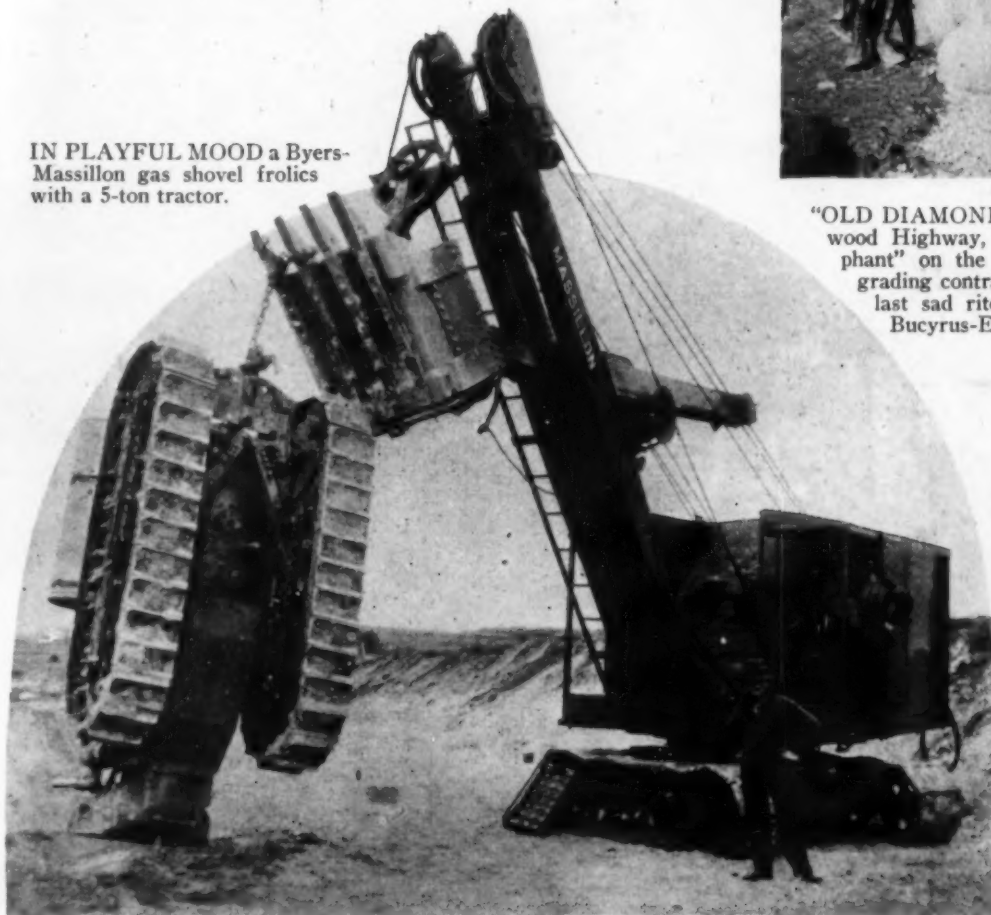


THODS

# JOB ODDITIES

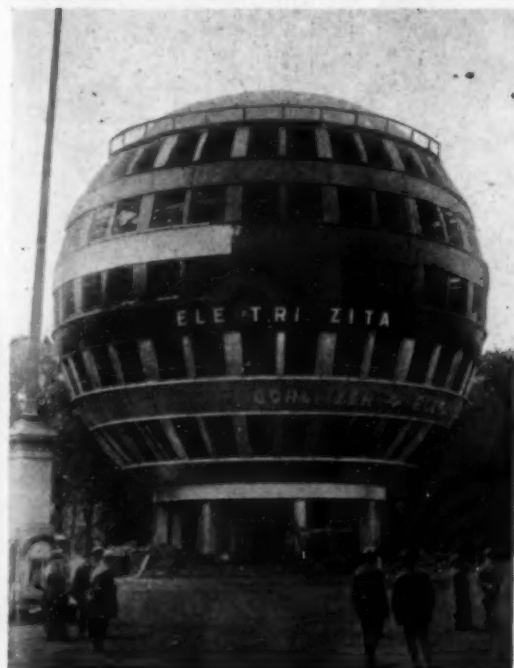
A Monthly Page of Unusual  
Features of Construction

IN PLAYFUL MOOD a Byers-Massillon gas shovel frolics with a 5-ton tractor.



"OLD DIAMOND," circus pachyderm which died on Redwood Highway, California, proved to be a "white elephant" on the hands of W. H. Hauser, hauling and grading contractor of Oakland, until he speeded up the last sad rites of burying the 7-ton carcass with a Bucyrus-Erie steam shovel and a pair of tractors.

If there's anything odd on  
your work, mail the Editor  
a snapshot of it.



© Wide World Photos

**MOSTLY WINDOWS.** This spherical house, a futuristic conception shown at the recent city planning exposition in Dresden should come close to providing its occupants with Irvin Cobb's famed "privacy of a gold fish."



**SHINTO PRIESTS** performed rites lasting more than an hour in giving a spiritual O.K. to the new Ford factory in Yokahama just before the H. K. Ferguson Co., contractor, of Cleveland, Ohio, began construction.

# Getting Down to DETAILS

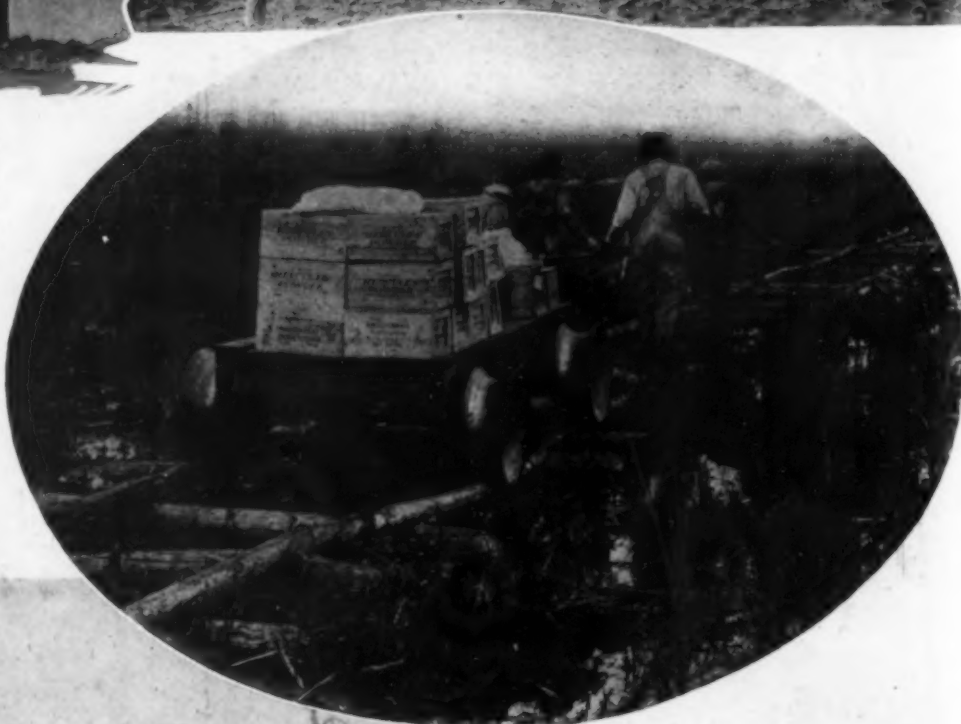
Close-up Shots  
of Job  
Methods and  
Equipment



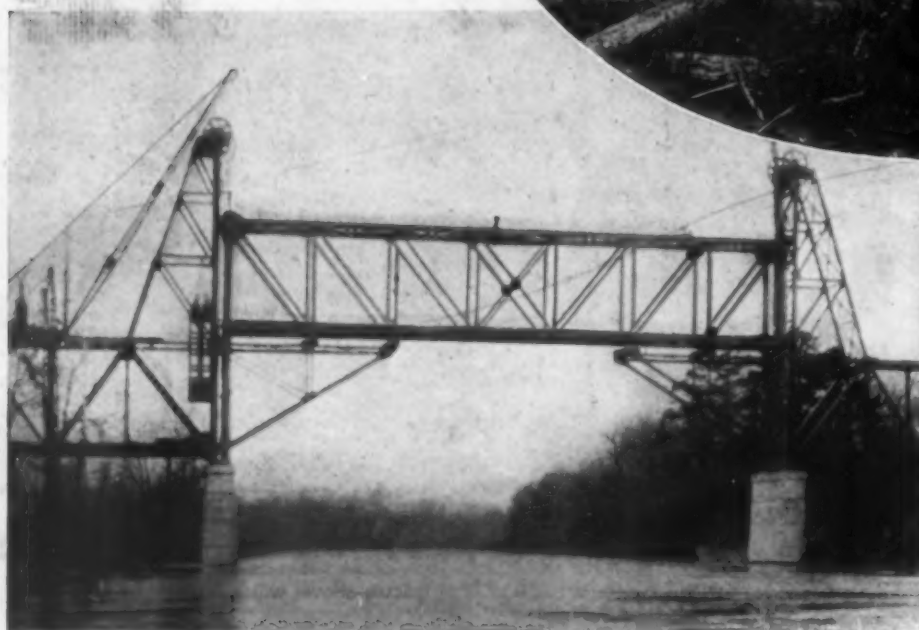
PENDULUM RIG developed by Joseph Schmidler of the State Highway Department for breaking down old concrete culvert walls in Milwaukee County, Wis. Four men start the 1,250-lb. cast-iron ball swinging.



OVERHEAD PIPES (*above, right*), supported by cable distribute water used in wetting embankment for Lafayette Dam, California.

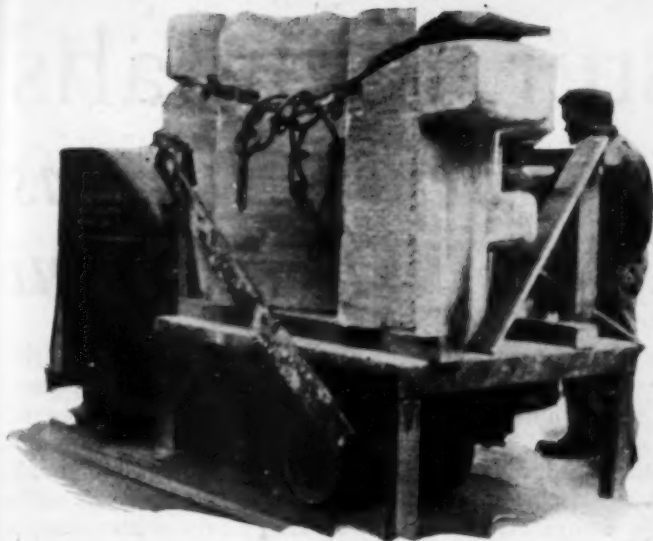


LOG RAIL TRAMWAY, used by Alexander, Ramsay & Kerr, Inc., to transport construction materials for Tamiami highway across the Everglades where oxen could not penetrate. (See p. 6, for further details.)



FALSEWORK BRACKETS (*left*), of structural steel, support lift span in raised position, leaving river open for navigation, on railroad bridge which the Kansas City Bridge Company is erecting over the Black Warrior River near Demopolis, Ala.

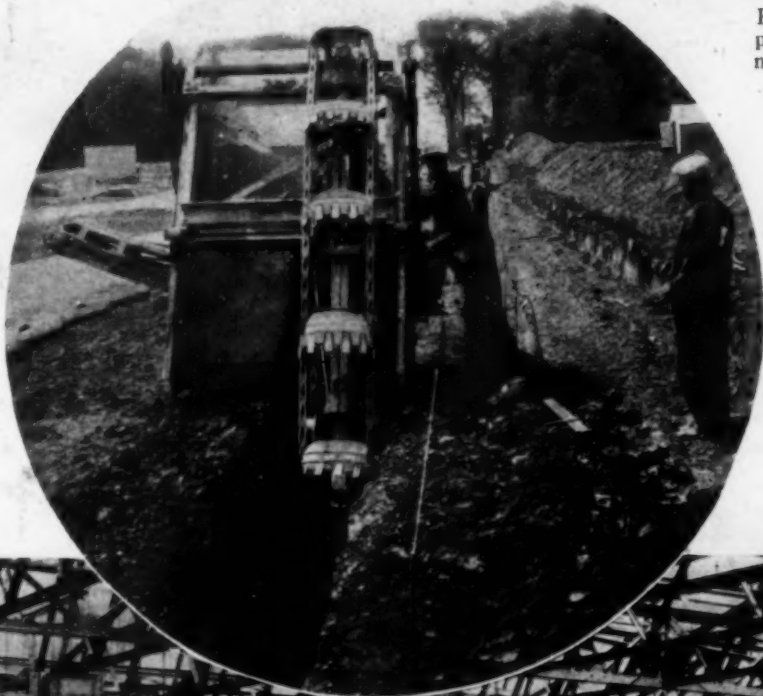




PORTABLE PLATFORMS moved by small gasoline trucks equipped with hoists save time in placing stone for Tracy Brothers at Waterbury, Conn.



ROLLING DEVICE used in conjunction with a Caterpillar tractor by the Western Concrete Pipe Company to move heavy sections of sewer pipe.



TWO-IN-ONE trenching operation (left). F. F. Fry, Ltd., dug a water trench and backfilled a sewer ditch in Bridgeburg, Ont., at the same time with a Parsons trench excavator. The ditches were only 5 ft. apart, center to center.



SHOVEL DIPPER LOADS SKIP of mixer in crowded quarters. A Bay City tractor-shovel was installed in the low headroom of a General Motors Company building by the Everett Winters Construction Company of Detroit to handle aggregates from stock pile direct to mixer.

# Plaster Pharoahs

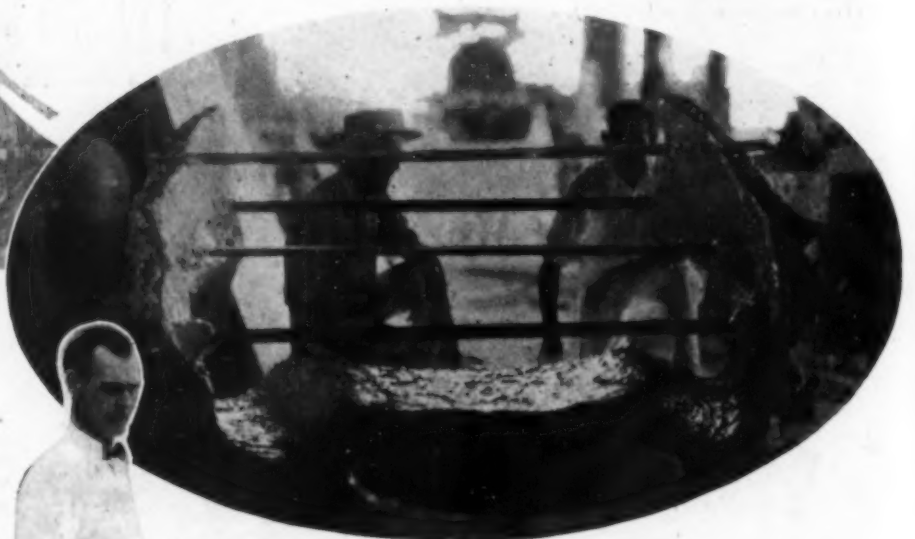
## *Construction Artisans*

### *For Miami*



THE FIGURES of Pharoah Kephrem were assembled in sections on frames in the yard of the shop.

JOSEPH J. ORR (right), shop superintendent, looked after Pharoah's physical development.



MAKING A CAST of Pharoah's chest.



THE ORIGINAL FIGURE was modelled in plaster composition and the mold was formed over it.



IN STRIPPING the sections of the mold, great care was taken not to damage the plaster original.



# Welcome Shriners

## *Prepare Monster Images*

### *Convention*

of Pharoah Kephrem, 16 ft. high, which lined the Avenue of the Gods. The original full-size figure, instead of being molded in clay, was modelled in plaster so that it could be used as one of the finished statues. Stripping of the mold was accomplished without serious difficulty.

Casting and assembling of the figures proceeded simultaneously. The W. A. Dickinson Transfer Company with tractor-trailers and truck-mounted cranes moved the finished statues and placed them on their pedestals in the park.



STRIPPING THE MOLD  
from a cast of the head



POINTING THE JOINTS of one great figure. All the frames were metal-lathed and stuccoed at the same time.

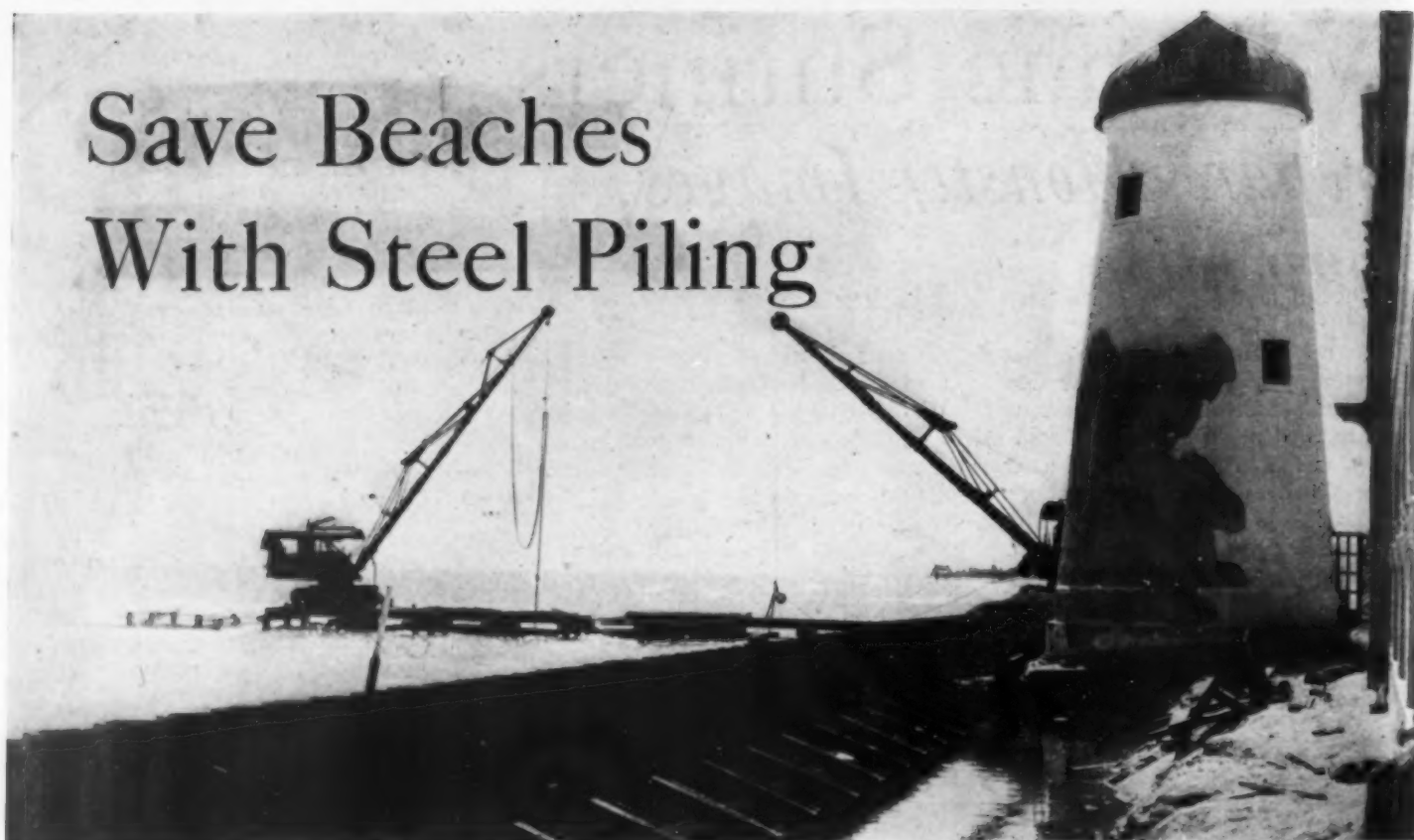


COMPLETED STATUES were hauled to the park on tractor trailers and placed by Universal cranes.

CURVED SLABS for the columns at the entrance to the Avenue of the Gods were cast in the shop and were fastened to the framing with slugs.

WILLIAM E. ORR (left), supplied everything for the oasis but the palms.

# Save Beaches With Steel Piling



**T**O PROTECT valuable property from storms and to build up the beach, 3,900 ft. of bulkhead and a total of 3,000 ft. of groins were constructed by the City of Miami Beach, Fla., last winter. The design and construction of these protective works aroused unusual local interest.

Both bulkhead and groins were built of Larssen deep section copper-bearing steel sheet piling. In the bulkhead, the

length of piles was 23 ft., with the exception of every sixth pile, 36 ft. long, which was driven into rock. The effective width of the Larssen piles being 15½ in., the longer piles were spaced 7 ft. 10½ in. apart. Elevation of the top of the wall was +8. A 10-in. 30-lb. channel was bolted to the back of the bulkhead piles, as the drawing on the opposite page shows.

To anchor the bulkhead a 25-ft. un-

treated timber pile was driven 10 ft. behind each long sheet pile. The timber pile was cut off at elevation +0.5. These anchor piles were connected by a 10x12 untreated timber running the full length of the bulkhead and were trussed to the sheet pile wall by 8x8 creosoted struts and 1-in. tie rods. The drawing on the opposite page gives the general design.

The groins extended into the water at right angles to the bulkhead. All groins were 200 ft. long except the ones at the ends of the bulkhead. These were 125 and 175 ft. in length. The elevation of the top of groin at the bulkhead was +5; at the outer end, +2. Treated timber piles 25 ft. long were driven 8 ft. apart along each side of the groin. These piles were staggered, making them 4 ft. c. to c. measured along the center line of the groin. As one of the photographs shows, timber wales were bolted between the wood piles and the steel sheet piles.

All steel was treated to elevation -2. For the first part of the job Wailes Dove-Hermiston protective treatment was used, but on the latter part Inertol was applied. Angles, rods and ungalvanized bolts were treated the same as the steel piles. Creosoted timber was given 20-lb. treatment.

The quality of the workmanship on the bulkhead and groins has won the praise of every construction engineer who has inspected it. Alignments and grades are as nearly perfect as it is humanly possible to make them. R. W.

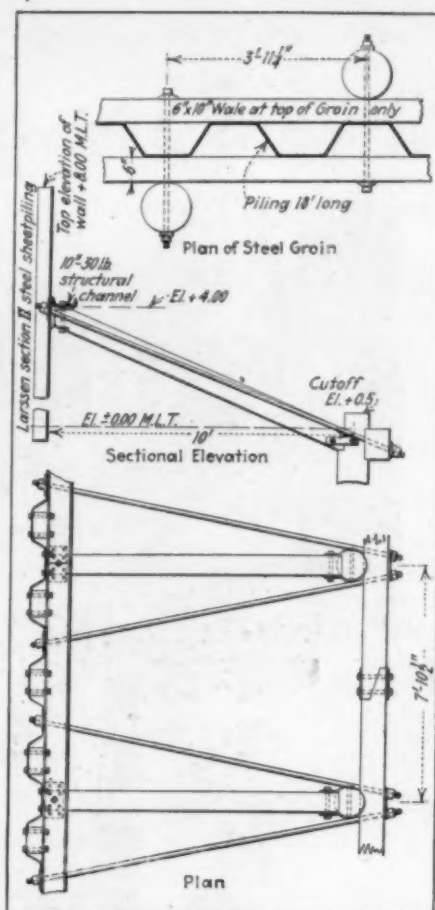


**BULKHEAD PILES** were jettied into position against an alignment wale. Every sixth pile was 36 ft. long. Intermediate piles were 23 ft. in length.



Reed, vice-president and general manager, and H. L. Schreiber, superintendent, were in charge of the work for the contracting company, G. O. Reed, Inc., of Miami Beach. These men made a systematic effort to see that all operations were carefully and efficiently performed.

In constructing the bulkhead, guide piles were first jetted into place to carry the alignment wale. The steel sheet piles were set in correct line against this wale. The 23-ft. piles were jetted to within 6 in. of grade, while the 36-ft. piles were jetted to rock at approximately -23. Two 2,200-lb. drop hammers were used to tap the shorter piles to grade. The longer piles were driven an average of 6 ft. into rock with steam hammers. With both types of hammers the final driving was expensive. Horizontal and vertical alignment had to be within  $\frac{1}{4}$  in. of true line and any sheet below grade had to be either pulled and re-driven or built up with a welding outfit.

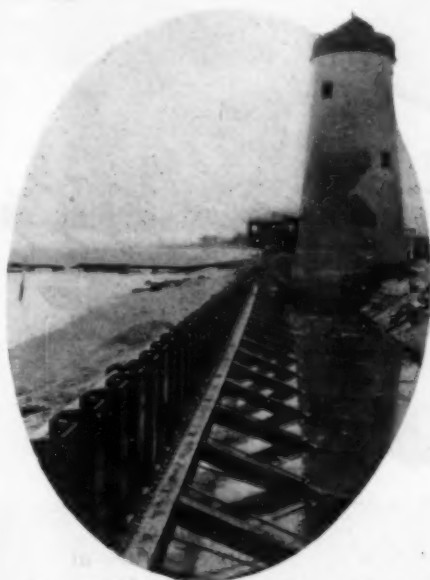


PLAN OF GROIN and plan and elevation of bulkhead, showing anchorage and truss systems.

In spite of bad weather conditions, good progress was made in jetting piles. A 5-in. pipe line was laid along the beach with connections for smaller pipe at convenient intervals. Each crane engaged in jetting piles was equipped with a 30-ft. 2 $\frac{1}{2}$ -in. jet connected to the auxiliary pipe line by a section of 2 $\frac{1}{2}$ -in. heavy-duty fire hose long enough to allow the boom to be swung around to pick up a pile while a hole was being jetted. One crane would jet and drive 48 bulkhead piles a day.

Four P & H gasoline cranes were used in setting, jetting, and driving the piles. After six and one-half months on this work every one of the cranes had to be taken apart and overhauled. Excessive rust due to action of salt water made this complete overhauling necessary. Open oil holes for squirt-can lubricating proved a particular source of trouble. Pressure grease cups alone were satisfactory. When the cranes were dismantled every oil hole was drilled and every ordinary grease cup was removed to make way for a complete installation of pressure grease cups. To keep these cups filled the highest pressure grease gun available is used.

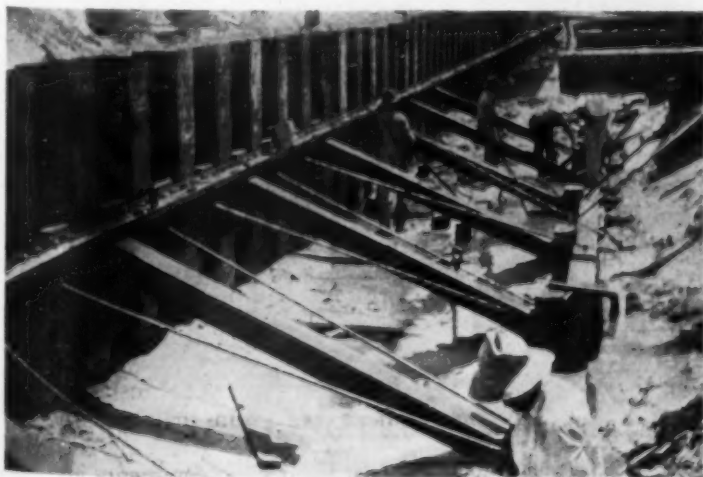
The cranes, using clamshell and drag-line buckets, also excavated the trench for the bulkhead. Three centrifugal pumps kept the trench dry. An electric-motored Worthington four-stage centrifugal pump and a gas-engined Lecourtenay three-stage centrifugal pump kept up the pressure in the jetting system.



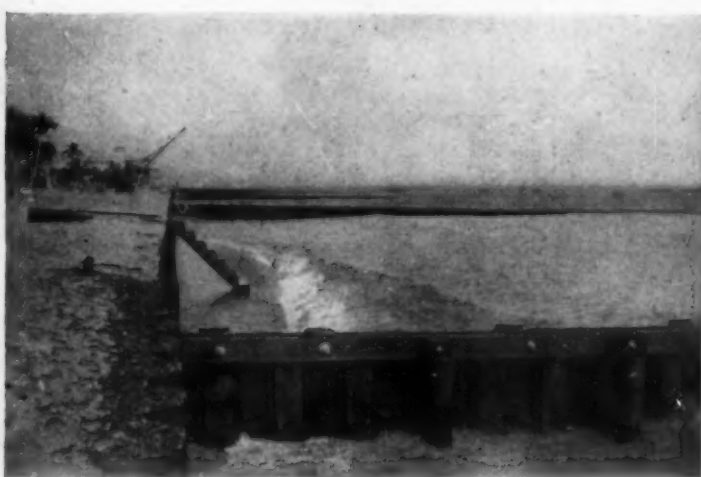
A STRUCTURAL CHANNEL was bolted to the back of the bulkhead piles.



TIMBER PILES in the groins are bolted to wales and steel sheet piles.



THE WALL was guyed and braced with struts and tie rods to the anchor piles.

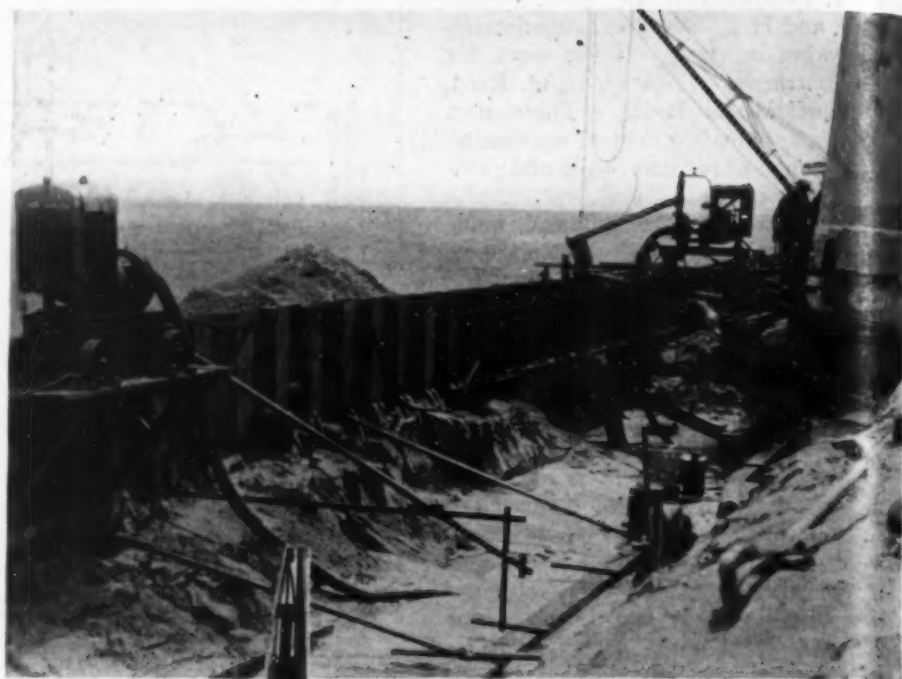


THE GROINS have collected sand rapidly since they were built last winter.

In building the groins, the cranes worked from timber pile trestles. Four-pile bents were placed 10 ft. apart. The caps were drifted to the piles and the four 12x12 stringers were bolted to the caps to prevent loss during storms.

The steel piles for the groins were 18 ft. long. They could be jetted to within a few inches of grade and then driven to final elevation. The timber piles along the sides of the groins were jetted within approximately 3 ft. of grade and were driven into rock.

The bulkhead and groins were designed and constructed under the direction of Ed. R. Neff, city engineer of Miami Beach. Victor Gelineau, Jersey City, gave consulting advice. The protective works have proved very effective. All the groins are collecting sand; some of them very rapidly. The valuable property along the beach is protected from damage in case of a hurricane.



CENTRIFUGAL PUMPS kept water down in the trench behind the bulkhead.

A CAST-IRON CYLINDER tapping an obstinate groin pile. The nipper line runs through the cylinder, which weighs 800 lbs. and guides it in its descent.



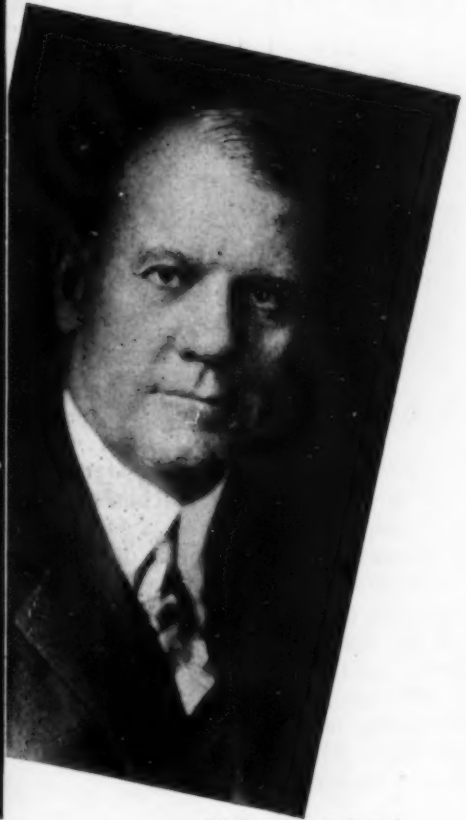
TO BUILD THE GROINS, cranes worked from pile trestle with four-pile bents spaced on 10-ft. centers.

**NEXT MONTH:** Building a concrete highway 16 miles long and 40 ft. wide through 11 towns and villages on Long Island, N. Y. The paving was done in 10 ft. lanes and four complete mixer units were operated by the contractor at one time. This is the largest single road-building contract ever let by the State of New York. How the job was handled by Johnson, Drake & Piper, Inc., will be told, pictorially, in the August number of "Construction Methods."



# Present and Accounted For —

## A Page of Personalities



©Underwood & Underwood

### PLANNING BOARD NAMED FOR MISSISSIPPI RIVER FLOOD CONTROL

BY the terms of the Jones-Reid bill, which became a law with the recent approval of President Coolidge, a board of three members has been created to recommend a plan of action to prevent a repetition of the disastrous floods of 1927 in the Mississippi Valley. The members of the new Flood Control Board are:

MAJOR-GENERAL EDGAR JADWIN (*center*), Chief of Engineers, U. S. Army. During the World War he served in France as Director of Construction and Forestry for the A.E.F.

COL. CHARLES L. POTTER (*upper left*), Corps of Engineers, president of the Mississippi River Commission. He has had a wide experience with the problems of Mississippi flood control.

CARLETON W. STURTEVANT (*upper right*), Civilian member of the board. He has specialized in river and harbor work, including service with the Atlantic, Gulf & Pacific Co., the New York State Barge Canal, James Stewart & Co., J. G. White Engineering Corporation and New York State Dredging Corporation. During the war he commanded the Fifteenth Engineers in France, with rank of colonel.



### CHIEF ENGINEER, A.R.B.A.

C. N. CONNER has been appointed to the newly created office of chief engineer of the American Road Builders Association. His chief activity will be to co-ordinate the standardization work of the association's County, City and Pan-American Divisions.



### WINS ARC-WELDING PRIZE

JAMES W. OWENS, director of welding for the Newport News Shipbuilding & Drydock Co., received the \$10,000 first prize donated by the Lincoln Electric Co. for the best paper on arc welding. American Society of Mechanical Engineers sponsored the contest.

CONSTRUCTION METHODS—July, 1928



# NEW EQUIPMENT ON THE JOB

## Power and Speed

The type 1030 gas shovel-crane of the Bucyrus-Erie Company is now being produced for general distribution. Equipped with a 72½-hp. motor, the

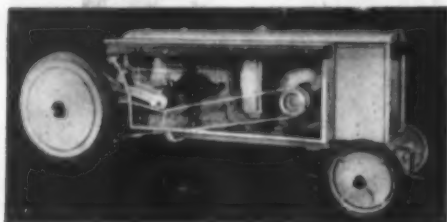


"1030" is claimed to have greater speed and power than other machines in the ¾-cu.yd. class.

Numerous improvements have been incorporated to increase the life of the wearing parts. Clutches are oversize, of the outside band type. The swing gears are held in positive alignment by a steel box housing. Truck frame and revolving turntable are one-piece steel castings. Only one drive shaft is used in the crawler-type mounting.

## A Welder Tractor

An improved tractor-driven electric arc-welding outfit is now being marketed by the General Electric Company. A type WD-300-A, 25-volt, 300-



ampere (one-hour rating), 1,750-r.p.m., ball-bearing generator is belt connected to a Fordson tractor. This unit is mounted on the tractor chassis

and is protected by a metal canopy and canvas side curtains.

The outfit has been designed especially for structural contractors, oil companies, pipe-line and tank builders, and such applications as require a machine for hard continuous use. Utility of the tractor as a hauling device has not been impaired. The unit will haul materials and then weld them. Overall length of the outfit is 12 ft.; the height, 4 ft. 8 in.; the width, 5 ft. 2 in. The weight is approximately 4,900 lb.

## Fast Revolving Crane

To speed up the building of a pile trestle, placing of pneumatic caissons and handling of miscellaneous materials

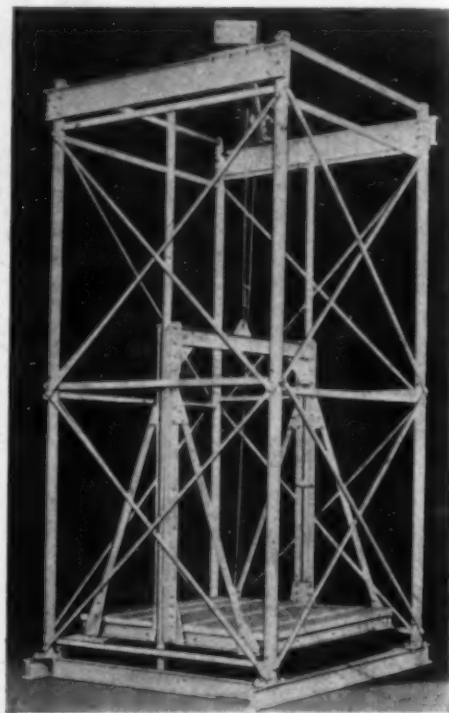


on shore, two light-weight revolving cranes were used on the foundation work of a bridge across the Arkansas River at Dardenelle, Ark. The cranes were built by the Lakeside Bridge & Steel Company at North Milwaukee, Wis.

Truck mounting makes quick moving possible. Steam, gasoline, or electric drive may be obtained in these machines.

## Improved Material Tower

A material tower which introduces a method for eliminating nuts and completely protecting bolt threads from the



weather has recently been placed on the market by the Lakewood Engineering Company. It has six fewer loose pieces for each 6-ft. 6-in. section of tower and requires two less bolts and no nuts.

## Air-Driven Saw

A new type of Wolf portable timber sawing machine has been announced by the Reed-Prentice Corporation, Worcester, Mass. The saw is



driven by an Ingersoll-Rand air motor. A pressure of 80 lb. and volume of 70 cu.ft. of air per minute is necessary to insure satisfactory operation.

## McGRAW-HILL PUBLISHING COMPANY, INC., Tenth Ave. at 36th St., New York, N. Y.

JAMES H. McGRAW, President  
JAMES H. McGRAW, Jr., Vice-Pres. and Treas.  
MALCOLM MUIR, Vice-President  
EDWARD J. MEHREN, Vice-President  
MASON BRITTON, Vice-President  
EDGAR KOBAK, Vice-President  
C. H. THOMPSON, Secretary

NEW YORK District Office, 285 Madison Ave.  
WASHINGTON, Colorado Building  
CHICAGO, 7 S. Dearborn Street  
PHILADELPHIA, 1600 Arch St.  
CLEVELAND, Guardian Building  
ST. LOUIS, Bell Telephone Building  
SAN FRANCISCO, 883 Mission Street  
LONDON, 6 Boulevard St., London, E. C. 4

Cable Address: "Machinist, N. Y."

### Publishers of

Engineering News-Record American Machinist  
Power Chemical and Metallurgical Engineering  
Coal Age Engineering and Mining Journal  
Radio Retailing Ingenieria Internacional  
Bus Transportation Electric Railway Journal  
Electrical World Electrical Merchandising

### Construction Methods

Electrical West  
(Published in San Francisco)

American Machinist—European Edition  
(Published in London)

Subscription is two years for \$1 to the United States, Canada, Mexico, Alaska, Hawaii, the Philippines, Porto Rico, Canal Zone, Cuba, Honduras, Nicaragua, Peru, Colombia, Bolivia, Chile, Dominican Republic, Panama, El Salvador, Argentina, Brazil, Spain, Uruguay, Costa Rica, Ecuador, Guatemala, Haiti and Paraguay. Extra postage to other countries, \$1 (total \$2 or 9s. 4d.) for two years. Single copy, 5 cents.

Change of Address—When change of address is ordered the new and the old address must be given. Printed in U. S. A. Copyright, 1928 by McGraw-Hill Publishing Company, Inc. Published monthly.

July, 1928—CONSTRUCTION METHODS



# BLAW-KNOX STEEL STREET FORMS

(Universal Forms)

for Curb, Curb and Gutter,  
Integral Curb, and Sidewalks



BULLETIN  
No. 1024

BLAW-KNOX COMPANY  
PITTSBURGH, PA.

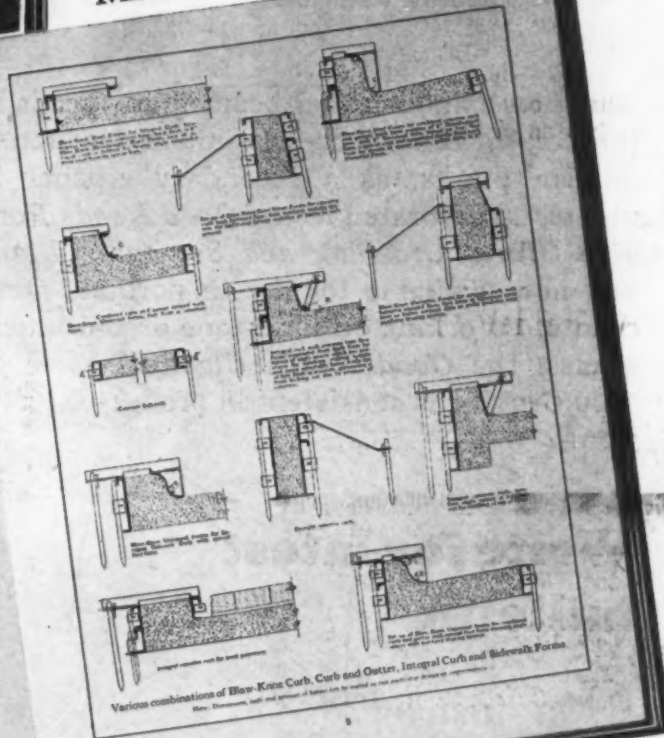
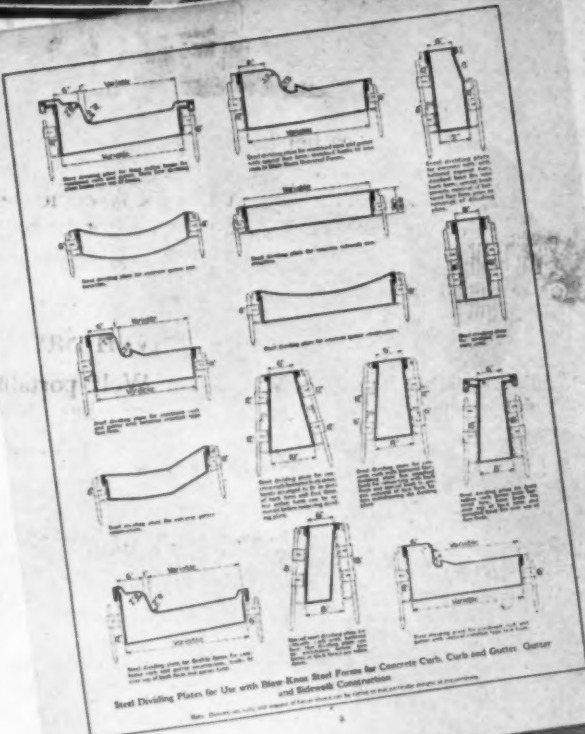
## Why Waste Wood?

These three words mean a great deal to any contractor with street and sidewalk contracts.

Wood forms involve excessive labor costs in setting and when the job is done—no form equipment left for the next job.

*Bulletin No. 1024 shows 60 illustrations that mean economy in your work. Send for your copy now.*

MAIL THE COUPON



**BLAW-KNOX COMPANY**  
686 Farmers Bank Building,  
Pittsburgh, Pa.

I would like to have a copy of your Bulletin No. 1024—Blaw-Knox Steel Forms for Streets and Sidewalks.

Company .....

Individual .....

Address .....

City ..... State .....

NOTE: Send us sketches of the work you intend to do (or tell us about it) and we will send prices of STEEL FORMS to do the job.

**Send for  
Your Copy**

# Keep a 'Good Roads

## "CHAMPION 1030" on your job

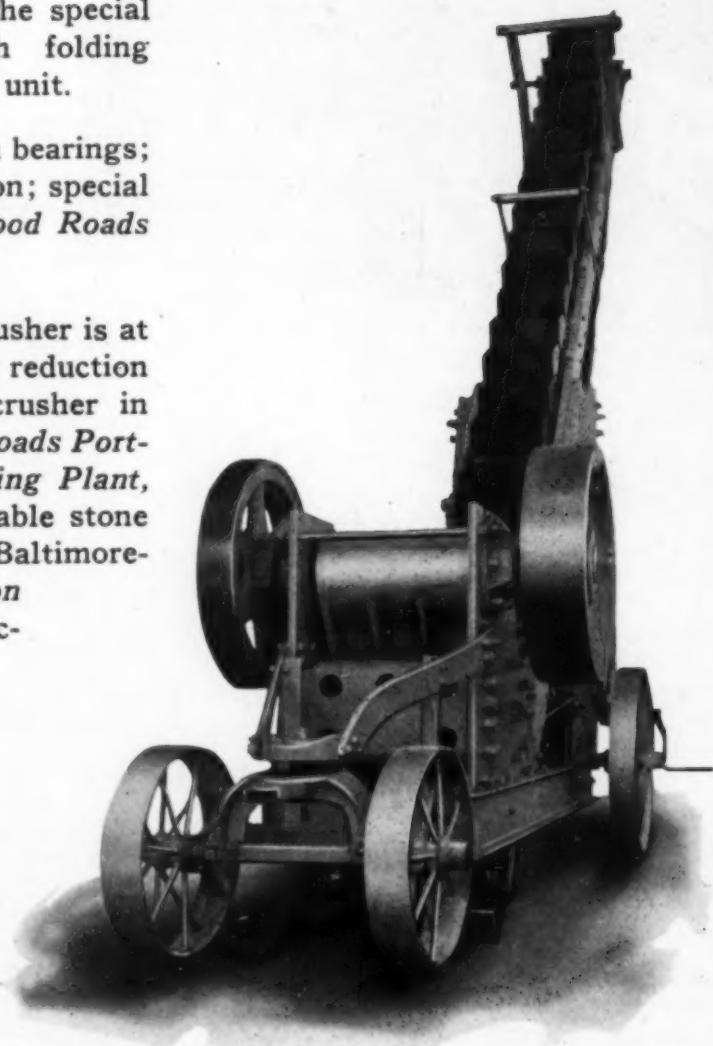
You will be able to do so with the special frame mounting complete with folding bucket elevator designed for this unit.

And what a crusher it is!—Timken bearings; S.K.F. bearings; Alemite lubrication; special steel of specific analysis; and "*Good Roads built.*"

This now famous roller bearing crusher is at the present time in use as the only reduction unit in plants, as a secondary crusher in plants, incorporated in the *Good Roads Portable Gravel Crushing and Screening Plant*, and now available for use in portable stone plants. Working on limestone or Baltimore-gneiss, the *Good Roads Champion 1030 Crusher* is consistent in production.

**Write for latest  
bulletin**

*just off  
the press*



**The Good Roads Machinery Co., Inc.**

**Kennett Square, Pa.**





THEW  
CENTER  
DRIVE



**T H E W**

The simple rugged construction of Theew Center-Drive on truck, power take-off and boom assures easier operation and greater profits. Fewer parts of greater strength reduce breakdown delays to a minimum. Faster and easier operation over a wide yardage. A 40% sales increase is the evidence of users' satisfaction and profit.

THE THEW SHOVEL COMPANY  
LORAIN, OHIO

# LORAIN 60 AND 75

Shovels  
Cranes  
Draglines  
Backdiggers

# THEW

Gasoline  
or  
Electric  
Powered





*This Same Machine Originally Finished the Concrete Base Course on this Job*

# ASPHALT... Mechanically Finished... with a LAKEWOOD Type "C" Screed

Excerpts from an article in March 29th issue of Engineering News-Record on the Mechanical Finishing of Asphaltic Pavement with a Lakewood Type "C" Screed.

"In operation, machine finishing develops some sharp differences from hand methods. It demands much less care on the part of the shovelers, since the only requirement is that they keep the material banked against the screed throughout its length, without attempting to maintain a grade. The kneading action of the screed tends to equalize the density of the material on all areas crossed, leaving a surface ahead of the roller already partly compressed, and, what is more important, equally compressed.

Examination of the asphalt behind the finisher and behind rakers showed the superiority of the former.

An important factor contributing to the superior riding qualities secured by the new method was the speed with which the machine operation was completed.

The installation of the finisher was at once reflected in increased production.

Testing the rolled surface behind the finisher with a 10-ft. straight-edge showed few variations of as much as  $\frac{1}{4}$  in., the maximum allowed by the specifications. Thus patching was practically eliminated.

*Comparative Costs*—Much can be said for the use of the new method from the standpoint of economy."

We have prepared a pamphlet giving in detail the advantages of this important development in Asphalt Surfacing. The attached coupon is for your convenience.

**LAKEWOOD**  
The Lakewood Engineering Co., CLEVELAND - O.

EXPORT OFFICES: 30 Church St., New York City - CABLE ADDRESS: Brooklyn



*Finishing Asphalt with a Lakewood Type "C" Screed. The same machine was originally used for finishing the concrete base.*



Please send me complete information on the Screeding of Asphaltic Pavements with a Lakewood Type "C" Screed.

Name .....

Address .....

# Now in production--the outstanding the $\frac{3}{4}$ yd. gasoline shovel and crane

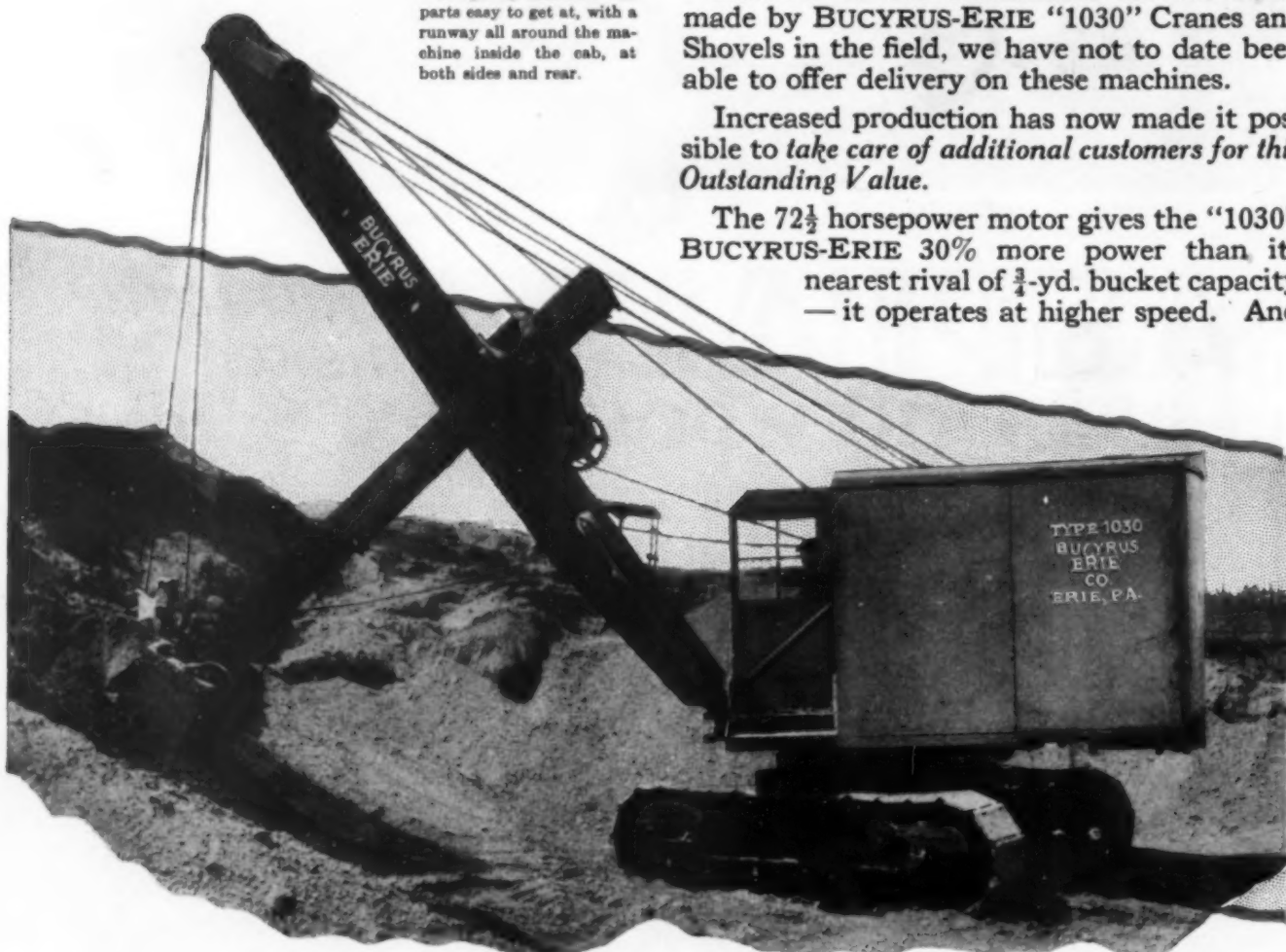
with far more Speed, and plenty

*Everything accessible—all parts easy to get at, with a runway all around the machine inside the cab, at both sides and rear.*

Because of the remarkable records being made by BUCYRUS-ERIE "1030" Cranes and Shovels in the field, we have not to date been able to offer delivery on these machines.

Increased production has now made it possible to *take care of additional customers for this Outstanding Value.*

The  $72\frac{1}{2}$  horsepower motor gives the "1030" BUCYRUS-ERIE 30% more power than its nearest rival of  $\frac{3}{4}$ -yd. bucket capacity—it operates at higher speed. And



The outstanding VALUE in its class—  
Appraised by 1,200 experienced construction  
men AT \$962 MORE THAN ITS ACTUAL COST

The low price of the BUCYRUS-ERIE "1030" is as much of a surprise to buyers as its extra speed and strength.

At the Road Show, in Cleveland, 1200 experienced contractors and other construction men, after carefully comparing all the machines exhibited, filed written estimates of the "1030's" price—and *their average estimate ran just \$962 above the actual price we have placed on this more powerful, faster machine.*

Unequalled engineering and manufacturing facilities, backed by unequalled resources, have produced *unequalled value.*

Make your own comparisons!

Extra strength—  
the big shafts look like axles

For instance, the big drum shaft is  $5\frac{1}{2}$  inches in diameter—and the whole machine is built on this plan, with a big extra margin of Strength and Reliability.

It's the crane and shovel that you can use with safety many miles from the nearest railroad.





# "buy" of the 1928 season-- with a 72½ horsepower motor--

of Strength to back it up

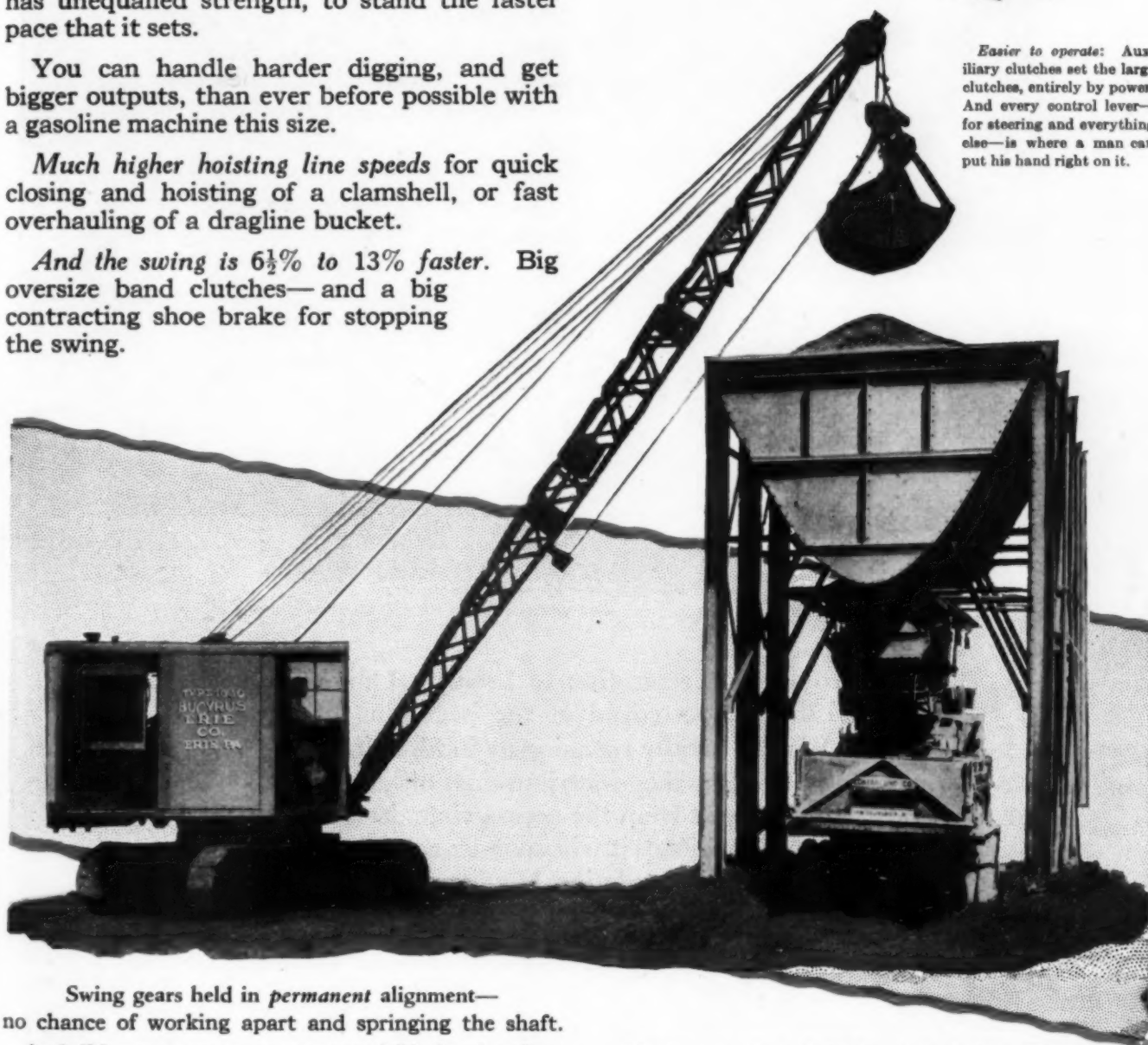
has unequalled strength, to stand the faster pace that it sets.

You can handle harder digging, and get bigger outputs, than ever before possible with a gasoline machine this size.

Much higher hoisting line speeds for quick closing and hoisting of a clamshell, or fast overhauling of a dragline bucket.

And the swing is 6½% to 13% faster. Big oversize band clutches—and a big contracting shoe brake for stopping the swing.

Easier to operate: Auxiliary clutches set the large clutches, entirely by power. And every control lever—for steering and everything else—is where a man can put his hand right on it.



Swing gears held in permanent alignment—no chance of working apart and springing the shaft.

And did you ever see so many anti-friction bearings on a gasoline crane? Every running shaft above deck that turns constantly at more than 34 R.P.M. is equipped with ball bearings of the finest type.

Gears running in oil—enclosed. The BUCYRUS-ERIE "1030" needs less attention for lubrication than any crane and shovel we have ever seen. The oiling job consists principally in checking up the oil levels every week or so.

Reversing bevel gears and swing gears run in oil—boom hoist runs in oil—transmission runs in oil—driving gears of the caterpillar type mounting run in oil.

Write us for details about the BUCYRUS-ERIE "1030". Get the facts about this ¾-yd. machine's unequalled Power, Speed and Strength.

## BUCYRUS-ERIE COMPANY

Plants: South Milwaukee, Wis., Erie, Pa., Evansville, Ind.

General Sales Offices: South Milwaukee, Wis., and Erie, Pa.

### Branch Offices:

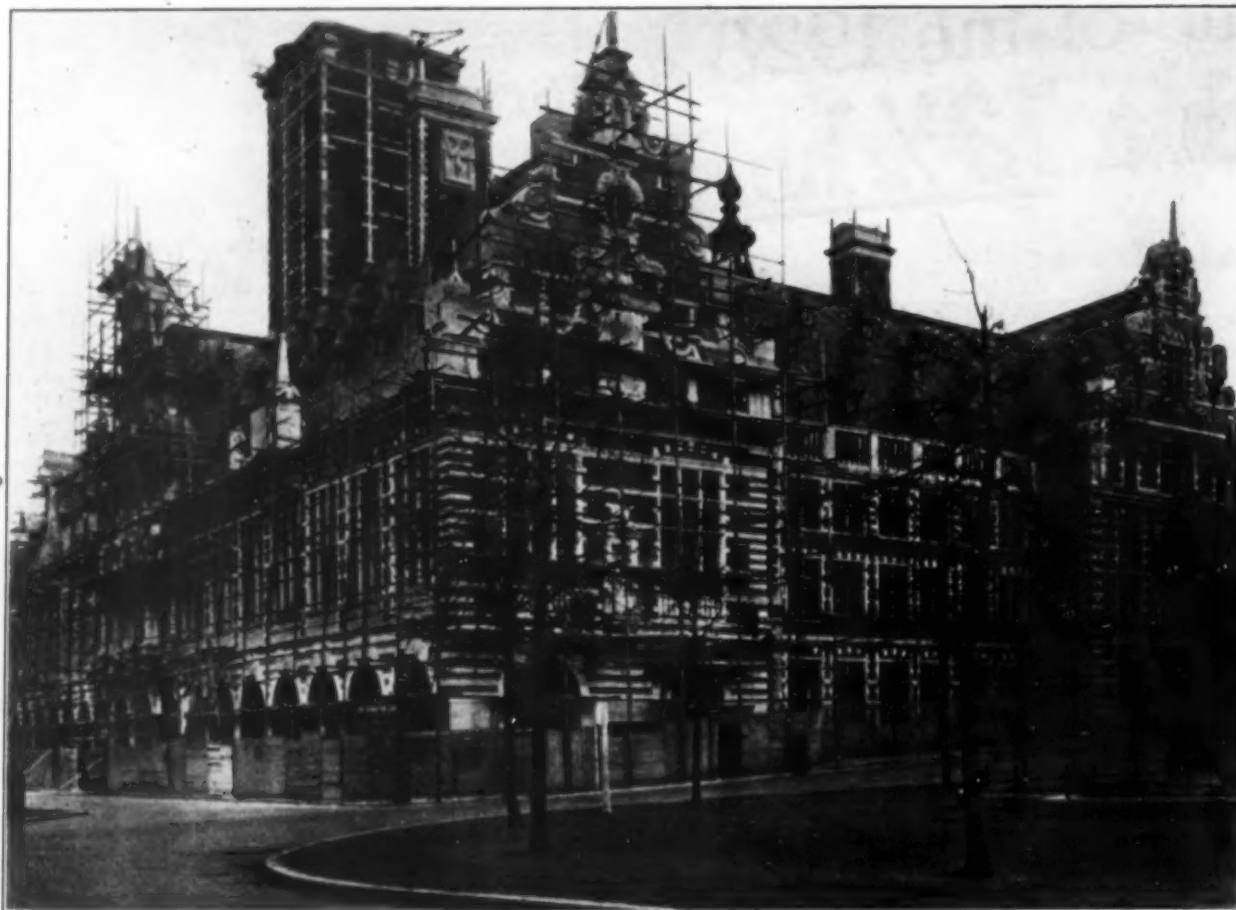
Boston  
New York  
Philadelphia  
Atlanta

Birmingham  
Pittsburgh  
Buffalo  
Detroit

Chicago  
St. Louis  
Dallas  
San Francisco

Representatives throughout the U. S. A. and Canada

Offices and agencies in all the principal countries throughout the world.



*Louvain University Library*

*Louvain, Belgium*

*Warren and Wetmore, Architects  
The Foundation Company, General Contractors*

The promise of restoration to Louvain University of its Library, destroyed at the beginning of the World War, is rapidly reaching its fulfilment. Made possible through the contributions of America's Students and built from the appropriate designs and plans of the Architect, it will soon be completed and dedicated. The Foundation Company takes great pride in its share in this achievement.

## THE FOUNDATION COMPANY CITY OF NEW YORK

*Office Buildings  
Industrial Plants  
Warehouses  
Railroads and Terminals  
Foundations and Underpinning  
Filtration and Sewage Plants*

**ATLANTA  
PITTSBURGH  
CHICAGO  
SAN FRANCISCO**

**MONTREAL  
MEXICO CITY  
CARTAGENA, COLOMBIA  
LIMA, PERU**

**LONDON, ENGLAND  
PARIS, FRANCE  
BRUSSELS, BELGIUM  
TOKYO, JAPAN**

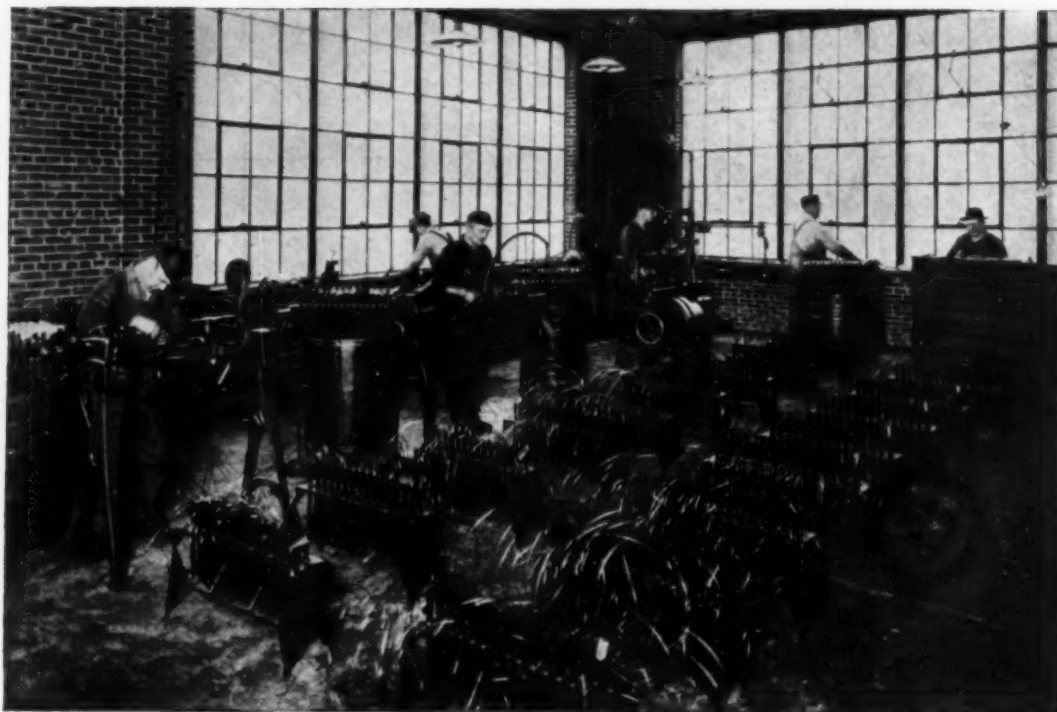
*Hydro-Electric Developments  
Power Houses  
Highways  
River and Harbor Developments  
Bridges and Bridge Piers  
Mine Shafts and Tunnels*

**BUILDERS OF SUPERSTRUCTURES AS WELL AS SUBSTRUCTURES**





# "HERCULES" RED-STRAND REG. U.S. PAT. OFF. WIRE ROPE



A Section of the Leschen testing laboratory, wherein every wire is thoroughly tested to determine its fitness. Any wire that does not come up to our standards in every respect is rejected.

## Rigid Tests Maintain the Quality

The uniformly high quality of "HERCULES" (Red-Strand) Wire Rope is not a matter of chance or guess, for every wire that goes into it is first rigidly tested by us to make sure that it fully meets our exacting requirements.

In order to have a firm basis on which to build, all Leschen Steel Wire Rope is made of acid open-hearth steel wire, as it has been shown definitely that acid-steel wire is more uniform and is better able to meet the hard conditions of wire rope work.

"HERCULES" (Red-Strand) Wire Rope is made in both Round Strand and Patent Flattened Strand constructions in order to meet all working conditions. Tell us how you use wire rope and we shall be glad to suggest the right construction for best results.



*The Wire Rope with the Service Record.*

Made Only by **A. Leschen & Sons Rope Co.** Established 1857

5909 Kennerly Avenue

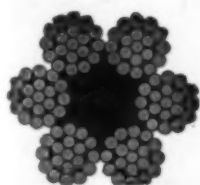
**ST. LOUIS**

New York

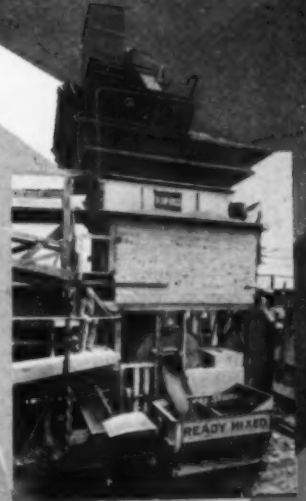
Chicago

Denver

San Francisco



# The Big 56-S Mixer



A Ransome 56-S Mixer in the General Mining Plant of the Ready Mixed Concrete Corp., Richmond, Virginia.



The Ransome 56-S mixer in the Central Station of the General Electric Co., Richmond, Va.

# Ransome



5 Ransome 56-S Mixers were used on the Walland Canal job.

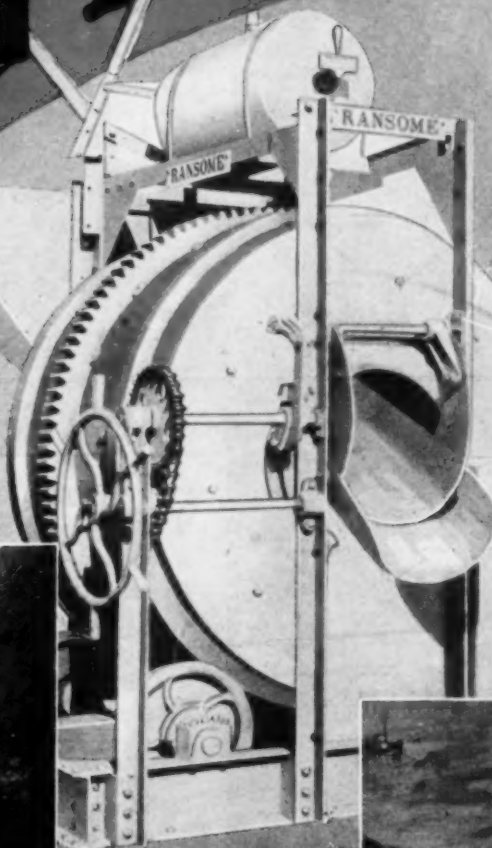


2 Ransome 56-S Mixers were used on the Hatch-Henry Dam job by the Utah Construction Co.



# The Big 28-S Mixer

## BIG MIXERS~



Dwight P. Robinson used thirteen Ransome 28-S mixers on the British Irrigation Project—thousands of miles away from factory service.



The Ontario Hydro Electric Commission used twenty-five Ransome 28-S mixers on the Queerens-Chippewa Power Development.



The Raymond Concrete Pipe Company is using two Ransome 28-S mixers on the San Francisco Bay Toll Bridge job.

When a BIG contractor or an operator of a Central Mixing Plant requires one or more BIG mixers on a BIG job, usually you will find that he has placed his confidence in Ransome.



**Ransome Concrete Machinery Company**

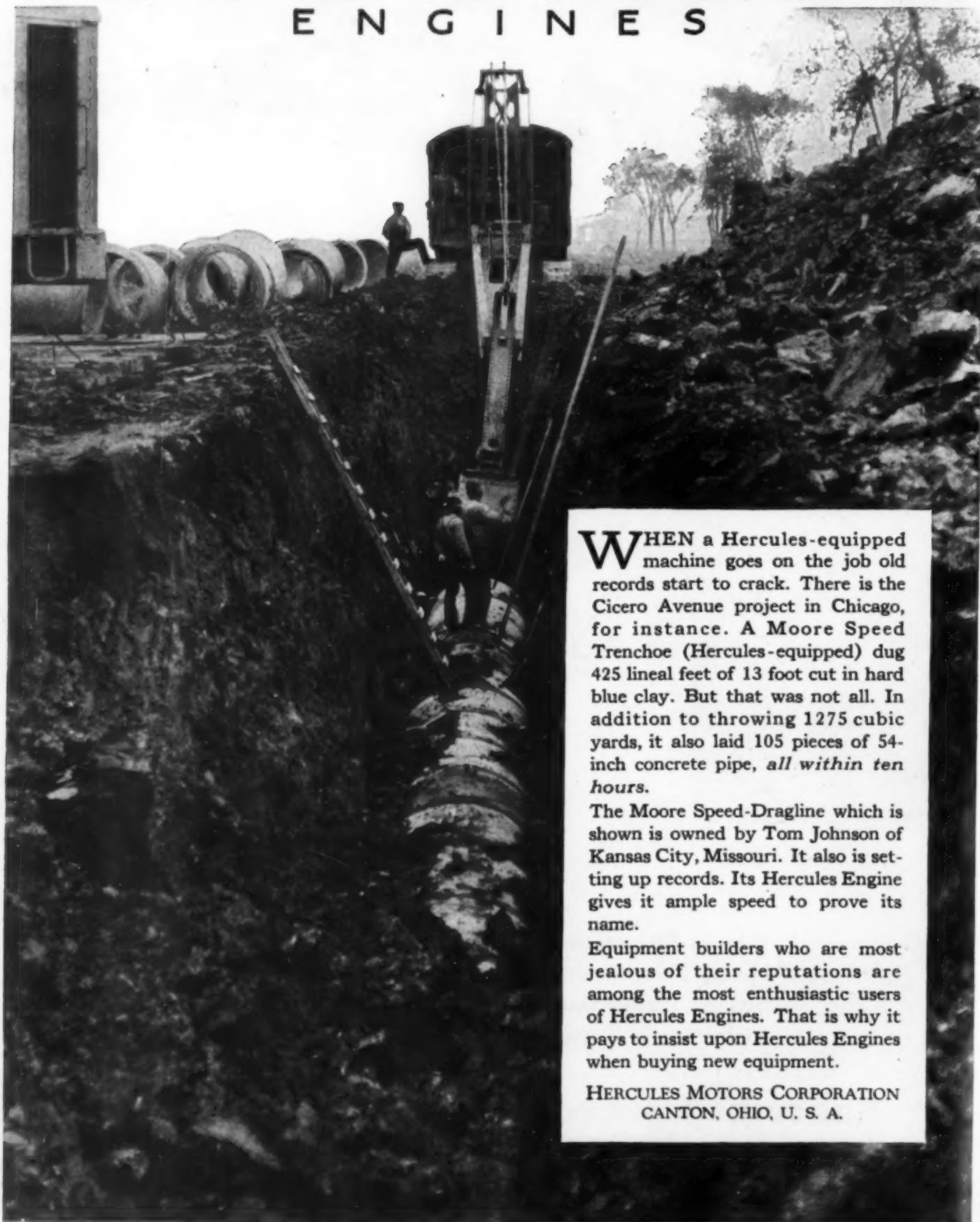
1858—Service for 78 Years—1928

**Dunellen**

**New Jersey**

# Hercules

## ENGINES



**W**HEN a Hercules-equipped machine goes on the job old records start to crack. There is the Cicero Avenue project in Chicago, for instance. A Moore Speed Trencher (Hercules-equipped) dug 425 lineal feet of 13 foot cut in hard blue clay. But that was not all. In addition to throwing 1275 cubic yards, it also laid 105 pieces of 54-inch concrete pipe, *all within ten hours.*

The Moore Speed-Dragline which is shown is owned by Tom Johnson of Kansas City, Missouri. It also is setting up records. Its Hercules Engine gives it ample speed to prove its name.

Equipment builders who are most jealous of their reputations are among the most enthusiastic users of Hercules Engines. That is why it pays to insist upon Hercules Engines when buying new equipment.

HERCULES MOTORS CORPORATION  
CANTON, OHIO, U. S. A.



# NAT'L DEMOCRATIC CONVENTION HALL

Erected by  
a Crane that  
Builders  
Demand

UNIVERSAL CRANES are always in demand—that's the reason the Coffman-Werner Crane Service Co., and many other crane service companies throughout the United States can show busy, money making schedules like this:—

April 6 Finished roof on Democratic Convention Hall, completing schedule 28-day job in 10 days (Fig. 1)

April 7 (Saturday) Set 12 tons of steel

April 9 Started 1,400 yd. round-table excavation for I. & G. N. R.R. (Fig. 2)

April 21 Excavated 300 yds. on City pumping station

April 23 Started setting steel for 2nd and 3d stories of Cotton Exchange Building (Fig. 3)

April 29 Started 8,000 yd. dragline job 35 miles out of Houston (Fig. 4)

Mounted on a motor truck, this Universal speeded from job to job, saving hours in moving time, converting them into profit earning hours on the job. The busier you can keep, the more money you'll make—that's why Universal mobility and adaptability represent profits to you.

Send for Folder 204A, an illustrated diary showing how another Universal did 15 jobs in 30 days and figure what the profits would have been to you.

THE UNIVERSAL CRANE CO., 910 Sweetland Building CLEVELAND, O.



UNIVERSAL

LARGEST and ONLY EXCLUSIVE BUILDERS of TRUCK CRANES

# You Can Dig Clay Quicker

Slow expensive pick-and-shovel labor can quickly eat up profits in in pipe trenches, sewer tunnels, and building excavations.

But there is a better way to dig clay!

Use Sullivan Spaders run by a Sullivan "Vibrationless" Compressor. They will cut your pick-and-shovel crew in half—make estimated profits come true—and help you shave your bids a little, too.



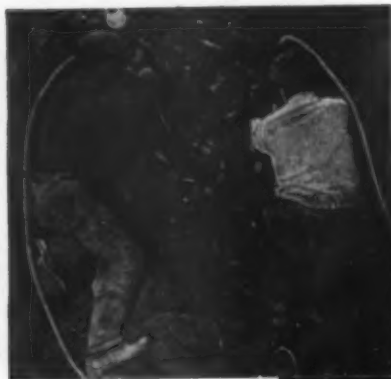
"DH-361"  
Short  
Shanked  
Spader



Sullivan Spader and "Vibrationless" Compressor digging clay at Grand Rapids, Mich. Note the precarious position of the Sullivan "Vibrationless" Compressor.

These powerful clay diggers are easy to handle. In close quarters where there is not room to swing a pick,

they work away at full speed. In open trenches long shanked spades and Tee-handles are available to save the laborer's back.



At Left: Sullivan Spaders using bull points in hard dry clay, in Milwaukee sewer tunnel.

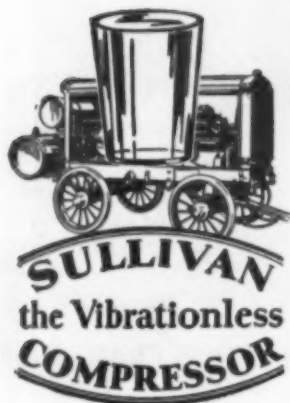
Below: Chambering out manholes in a Detroit sewer trench.



Sullivan "Vibrationless" Compressors with their dependable and smooth operation are always ready—easy to put on the job—and they stay put, in shaky places.

Once you dig your clay with Sullivan Spaders, you will no more revert to the pick and shovel than you would to drilling your rock by hand.

*Let us send you  
the Catalogs.*



**S U L L I V A N**  
TRADE MARK  
**SULLIVAN MACHINERY COMPANY**

168 South Michigan Ave., Chicago

Boston New York Cleveland Pittsburgh St. Louis Knoxville Birmingham Dallas Duluth Denver  
Spokane El Paso San Francisco Salt Lake City





## HUMPHRYES

940-EDT (LeRoi)

This double diaphragm pump is used where greater capacities and higher suction lifts are required. Its maintained suction enables it to develop a higher vacuum, making greater suction lifts possible. The sturdy rigid trucks and wide high wheels make it easy to move over the roughest ground. It can be furnished for gasoline or electric power

### This Humphryes Pump will deliver "*more gallons per day*"

*F*OR well-point drainage work you need a high capacity pump. You need a pump that will deliver a large volume hour after hour without a breakdown or stoppage. Humphryes pumps meet both these requirements.

Contractors appreciate their sturdy dependability. They like the accessibility of their vital parts. These features mean *more gallons per day*.

If you have an individual pumping problem, bring it to us. Our engineers will help you solve it.

Write for complete description and information about  
the entire line of Contractors' Pumps.

THE HUMPHRYES MANUFACTURING COMPANY  
Established 1882  
201 East Fifth Street  
MANSFIELD, OHIO

---

# HUMPHRYES

---

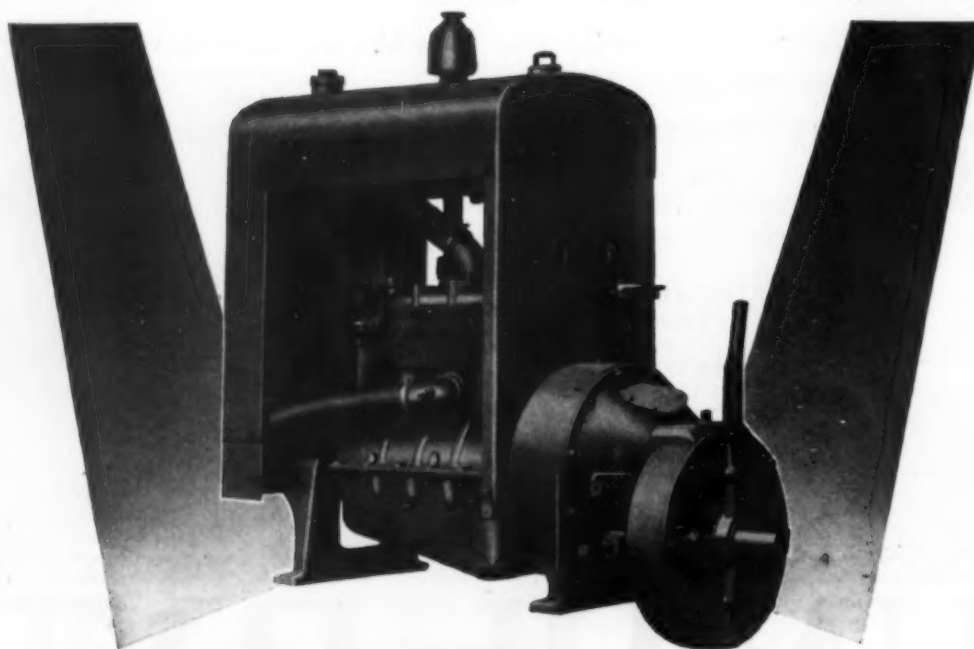
## CONTRACTORS' PUMPS

---



Buildings "nose" their towers high into the sky. They are lasting monuments of skillful hands. Staunch and sound—they reflect a mighty air of confidence. Their construction is **DEPENDABLE** — they are significant of strength.

Of no lower rank is Le Roi Power to construction work. Through years of field performance, it has carried its leadership well. Its claim to **DEPENDABLE POWER** is an earned one. In short—it runs longer at a lower operating cost. Look to the Le Roi for **DEPENDABLE POWER** and know it by what it does.



LE ROI COMPANY, Milwaukee, Wis.

**LE ROI ENGINES**  
**3 to 160 HORSE POWER**



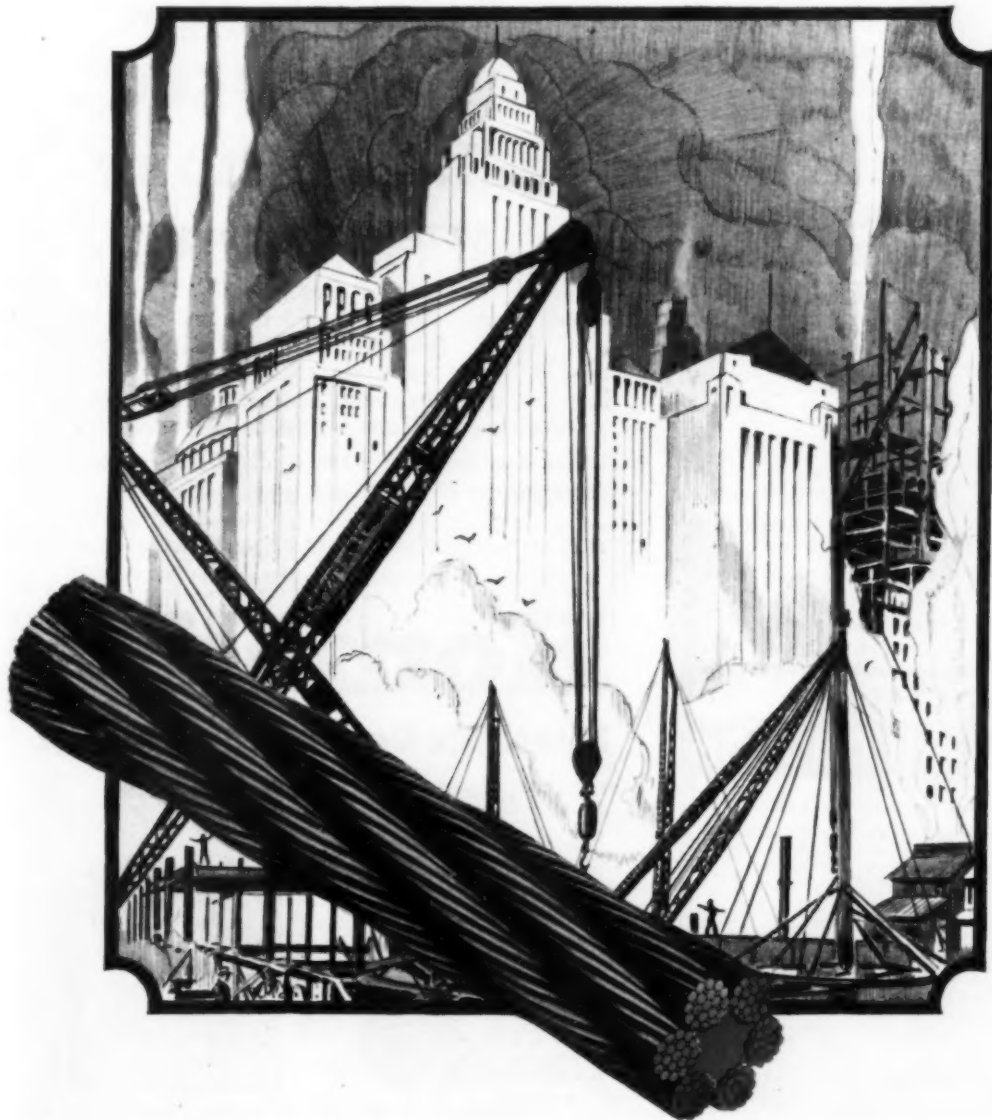
# Roebling

## "Blue Center" Steel Wire Rope

**A** superior product worthy of your consideration. It is made of the best grade of steel produced in our own furnaces. "Blue Center" Steel Wire Rope assures maximum safety and it is used where equipment is purchased on the basis of lowest

ultimate cost over a long period. Constructed to withstand heavy strains, abrasion and sudden pulls, it is the choice of particular engineers because of its dependability.

There's a Roebling Rope for every purpose.



John A.  
Roebling's  
Sons Company,  
Trenton, N. J.  
Makers of  
Wire Rope  
and Wire



**How  
crack  
construction  
men get  
things done—**

A manual of actual construction methods: methods that are used every day by practical construction superintendents and others upon whom rests the responsibility of getting things done. From first steps in organizing and preparing equipment, to pipework and painting; from pile driving to scaffolding, this new book covers everything in satisfying detail.

408 pages  
6x9  
327 illustrations  
Flexible  
Keratom  
\$5.00

**A  
McGraw-  
Hill  
Book**

**STANDARD  
CONSTRUCTION  
METHODS**  
By G. Underwood  
Construction Engineer

Everything in this book is practical, workable, and has been demonstrated over and over again in the field. It is a book no construction man will want to be without.

**Contents:**

I.—Organization and Equipment;	VIII.—Roofing and Flashing;
II.—Excavation;	IX.—Lathing and Plastering;
III.—Pile Driving;	X.—Scaffolds;
IV.—Concrete Construction;	XI.—Erection and Rigging;
V.—Wood Construction;	XII.—Pipework;
VI.—Brick Construction;	XIII.—Painting;
VII.—Steel Construction;	XIV.—Construction Schedules.

A real Chapter on rigging and erection work. Tables of safe capacities for tackle—a new, simple formula for strengths of manila and wire rope—figuring the strength of hooks and shackles—how to rig a gin-pole and shears, etc., etc., etc.

**McGraw-Hill**  
**FREE EXAMINATION COUPON**

McGraw-Hill Book Co., Inc., 370 Seventh Avenue, New York.

You may send me on 10 days' approval Underwood's STANDARD CONSTRUCTION METHODS, \$5.00 net, postpaid. I agree to remit for the book or return it postpaid within ten days of receipt.

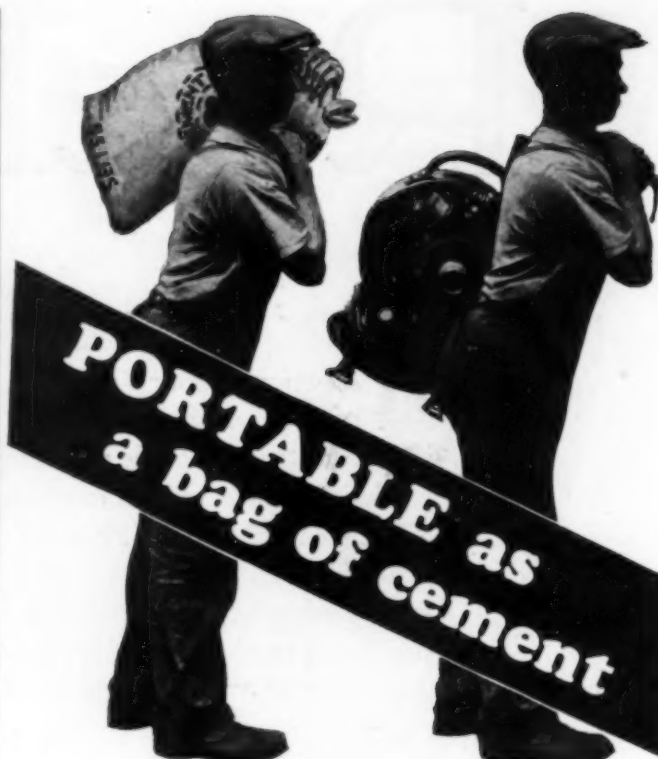
Subscriber to Engineering News-Record?.....

Signed .....  
(Please Print)

Address .....

Official Position .....

Name of Company.....  
(Books sent on approval to retail purchasers in the U. S. and Canada only.) C.M. 7-1-28



**PORTABLE as  
a bag of cement**

Same weight . . . about same size

**Pumps 7500  
gal. per hour  
\$225 at factory**

Homelite Centrifugal Pump with 1½ H.P. air cooled engine weighs but 95 lbs., measures 1x1½x 2 ft., shaped for easy one-man handling, pumps muddy, gritty water up to 30% solids. Bronze impeller, ball bearings, Robert Bosch moisture proof magneto. Runs 4-5 hours per gallon of fuel.

Write for name of nearest distributor who will demonstrate Homelite on your job.

THE HOMELITE CORPORATION, Port Chester, N.Y.  
Distributors in principal cities throughout the world.

**Homelite**  
**Portable Centrifugal Pump**



Thousands in use . . . all making good

2691





## "I Sold the Second C6 on the Strength of this Job"

**S**PEED and dependability were essential on this hurry up job at Market St. and Van Ness Ave. near the civic center in San Francisco.

So enthusiastic did the operators for the Municipal Railway become, that "I sold the second C6 on the strength of this job."

It's another instance of C6 efficiency. It regularly saves 50% of the cost and 75% of the time usually required to rip up city pavements and hard roads, break up frozen ground, cut manholes or enlarge trenches, as compared with hand methods.

Let us show you how a Cleveland C6 can speed up your work and reduce costs. We'll be glad to demonstrate any time at your convenience.

**The Cleveland Rock Drill Co.**

3734 E. 78th St., Cleveland, Ohio

*Branches and Distributors in Principal Cities*

# CLEVELAND ROCK DRILLS

## DIETZ "LITTLE GIANT"

**BURNS 70 HOURS  
WITHOUT REFILLING**

**W**HEN you give orders to have the traveling public protected against accidents on your construction work it will pay you to intrust the job to Dietz "Little Giant" Cold Blast Lanterns.

You'll find "Little Giants" as faithful as a bonded employee. They work long hours too, and will stay lighted in any kind of weather over a three day week-end or holiday.

**R. E. DIETZ COMPANY  
NEW YORK**

*Largest Makers of Lanterns in the World  
Founded 1840*



# "Caterpillar" Tractors *for* EARTH MOVERS



"Caterpillar" owners  
can put in the low bid and get  
the job...

Then, they can make a good  
profit on that job....

Then, they can finish  
it promptly and get an-  
other *profitable* contract!

*There is a  
"Caterpillar" Dealer  
near you.*

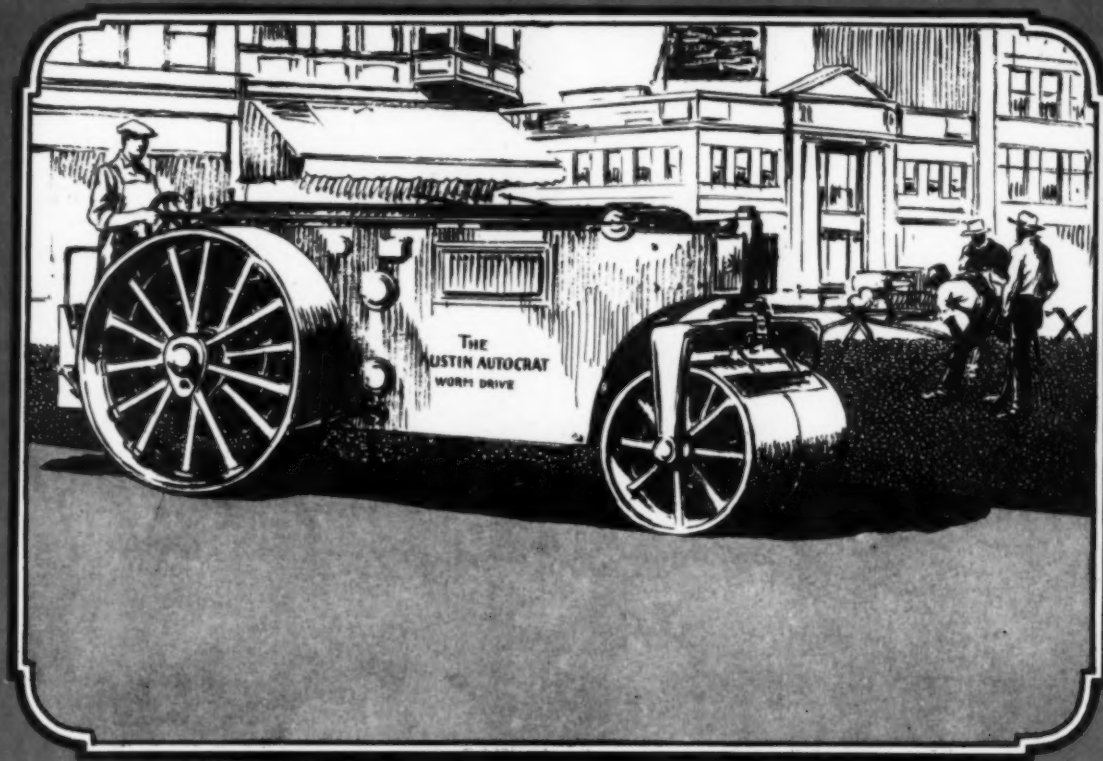
**CATERPILLAR TRACTOR CO.**  
Executive Offices: San Leandro, California, U. S. A.  
Sales Offices and Factories:  
Peoria, Illinois      San Leandro, California  
Distributing Warehouse: Albany, N. Y.  
New York Offices: 50 Church Street  
Successors to  
**BEST** T. L. Best      The Holt Manufac-      **HOLT**  
Tractor Co.      turing Company

  
*better  
quicker  
cheaper*

**CATERPILLAR**  
REG. U.S. PAT. OFF.

T H E   A U S T I N   W E S T E R N   L I N E

# AUSTIN AUTOCRAT



## *The Influence of Leadership*

Leaning Wheel Graders  
Straight Wheel Graders  
Motor Graders  
Elevating Graders  
Dump Wagons  
Crawler Dump Wagons  
Scarifiers  
Rock Crushers  
Portable Conveyors  
Rollers (Steam and  
Motor Driven)  
Motor Sweepers  
Street Sweepers  
Sprinklers  
Road Oilers—Culverts  
Hot Patch Repair Outfits  
Plows and Scrapers

**T**WENTY YEARS AGO Austin built the first motor road roller in America. Since that time paving construction and maintenance has been so well served by Austin Motor Rollers that they have strongly influenced the trend of design of *all* rollers, and may well be called the country's standard.

The Autocrat, culminating the experience of twenty years with the most advanced type of mechanical construction yet produced, is a fitting symbol of Austin-Western's position in the road machinery field.

## AUSTIN-WESTERN ROAD MACHINERY

"MOST MILES FOR YOUR ROAD DOLLARS"



# The First Worm Drive Motor Roller in America

## *The Austin Autocrat*

A worm drive is an entirely new application as far as road rollers are concerned, usually being used only in the best and most expensive motor trucks and machine tools.

The Duplex Worm Gear Drive by which the power of the modern four cylinder motor is transmitted to the clutches and rear axle makes the Autocrat

the outstanding road roller of today. The immediate and practical results of this feature are at once apparent from the operating viewpoint.

It transmits more power, makes possible more immediate speed reduction, does not require expert attention, is fool-proof, and is silent in operation and entirely free from vibration.

### *Other Distinctive Features*

Twin-Disc clutches, fourteen inches in diameter control forward and reverse movements of the roller and operate by a single lever. There are three transmission speeds, both forward and reverse.

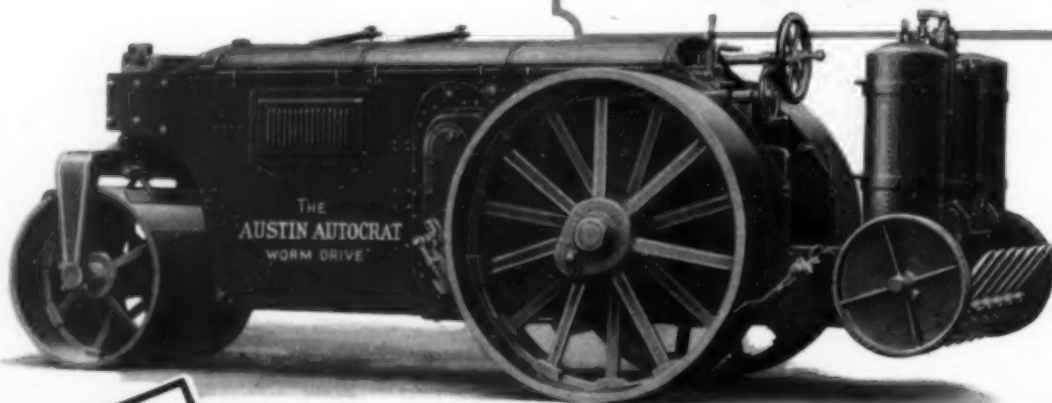
An electric self-starter operates from the control panel.

An enclosed differential gear is also regular equipment.

Oil and gasoline gauges and all controls are mounted on a panel directly in front of the operator.



A pneumatic scarifier of improved design and construction is a part of the special equipment that may be ordered extra.



The Austin-Western Road Machinery Co.  
Dept. 1407 400 N. Michigan Ave., Chicago, U. S. A.

☐ Motor Graders ☐ Road Graders ☐ Snow Plows  
☐ Dump Wagons ☐ Street Sweepers ☐ Rollers  
☐ Scarifiers ☐ Rock Crushers ☐ Sprinklers  
☐ Hot-Patch Repair Outfits ☐ Plows and Scrapers  
☐ Portable Conveyors ☐ Elevating Graders ☐ Oilers

Please send me literature and full information on items checked.

Name .....

Address .....

## The Austin-Western Road Machinery Co.

400 North Michigan Avenue  
CHICAGO, ILL., U. S. A.

Branches in Principal Cities

# For Jobs Marked "RUSH!"

EVERYBODY is talking about high early strength cement. That is a sign of the times—evidence of a rapidly growing realization that time saved is money earned.

But it pays to stick to first principles. In other words, you want speed with safety. That is to say, you want concrete of assured permanence plus the high early strength that saves real money on forms, allows of earlier occupancy or use, releases capital sooner, helps solve knotty engineering problems such as dangerous sub-soil conditions, traffic detours, etc.

"Incor" Cement is the answer to this dual need of speed with safety.

Concrete made with "Incor" Cement is strong enough to use in 24 hours; yet it has the assured permanence of Portland cement, because it is a perfected Portland cement in every sense of the term.

"Incor" Cement is made without admixtures of any kind; no foreign substance has been added. It is used in precisely the same way as other Port-

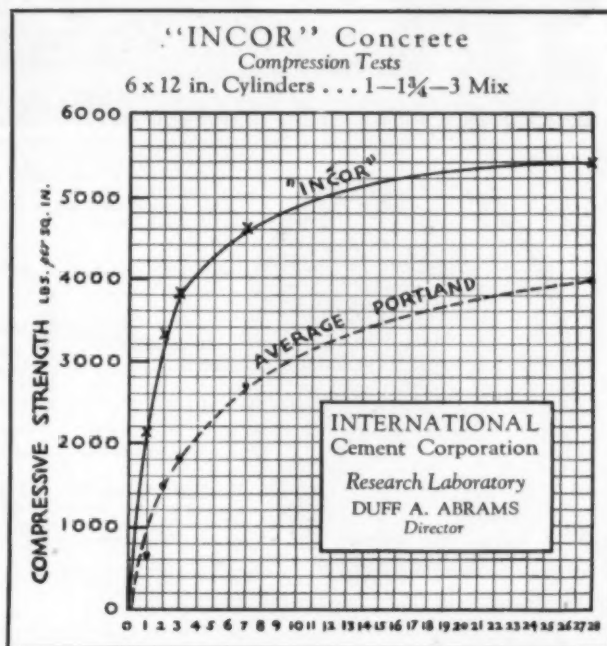
land cements. No new methods to teach the workmen.

Here is the soundest answer to the pressing need for speed. "Incor" Cement produces dependable 24-hour concrete.

INTERNATIONAL CEMENT CORPORATION

342 Madison Avenue, New York

One of the world's largest cement producers—  
13 mills, annual capacity 20,000,000 barrels



## "INCOR"

Perfected Portland Cement — Guaranteed  
by the manufacturers of Lone Star Cement

For Sale by

ALABAMA PORTLAND CEMENT CO.  
Birmingham Alabama

LONE STAR CEMENT CO. OF PA.  
Philadelphia Pennsylvania

TEXAS PORTLAND CEMENT CO.  
Dallas and Houston Texas

INDIANA PORTLAND CEMENT CO.  
Indianapolis Indiana

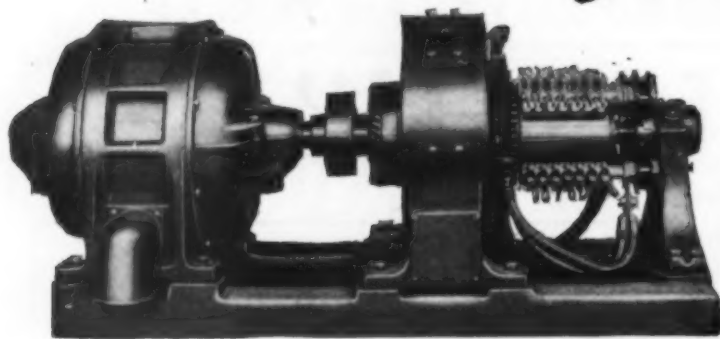
LOUISIANA PORTLAND CEMENT CO.  
New Orleans Louisiana

VIRGINIA PORTLAND CEMENT CORP.  
Norfolk Virginia

THE KANSAS PORTLAND CEMENT COMPANY  
Kansas City Missouri

KNICKERBOCKER PORTLAND CEMENT CO., Inc.  
Albany New York

# The more you arc weld



Multiple-operator sets—for simultaneous welding by a group of operators or for supplying power to automatic arc welders. Available in standard sizes from 400 to 1500 amperes

The more you arc weld, the more you save! The realization of this basic truth is rapidly and radically changing the nation's manufacturing methods.

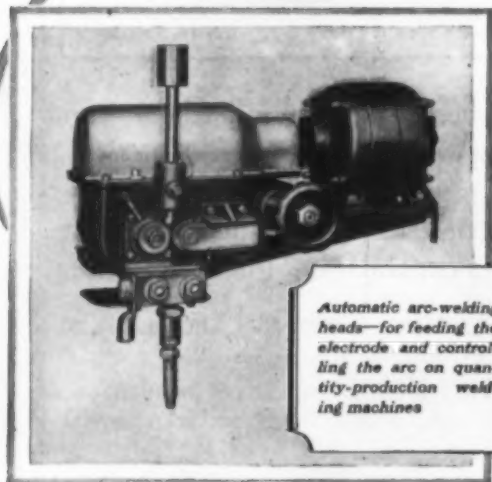
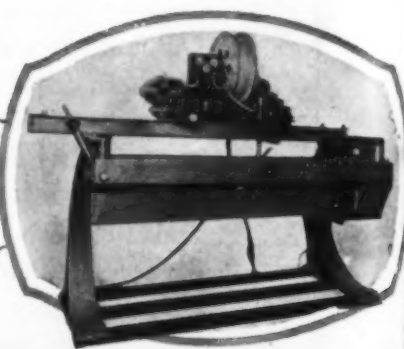
The "Arc Welding Age" has, to a large extent, come into existence as a result of developments by the G-E research laboratories and G-E welding engineers.

General Electric perfected the standard arc welding sets used to-day. It developed the automatic arc welder and made the first successful application of it.

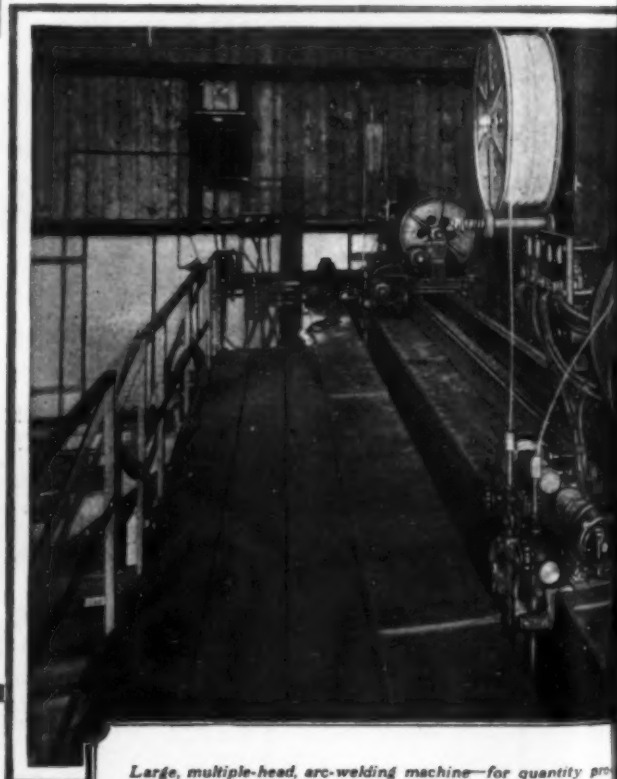


Electrodes—Type "F" for general welding of steel; Type "A" for welding cast iron; Type "B" for unequalled results in automatic welding

Automatic arc-welding machine—for quantity production of small tanks and pipes



Automatic arc-welding heads—for feeding the electrode and controlling the arc on quantity-production welding machines



Large, multiple-head, arc-welding machine—for quantity production. Equipped with four heads which



G-E Research Laboratories. Constantly at work in the interest of better arc welding



# GENERAL

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y.



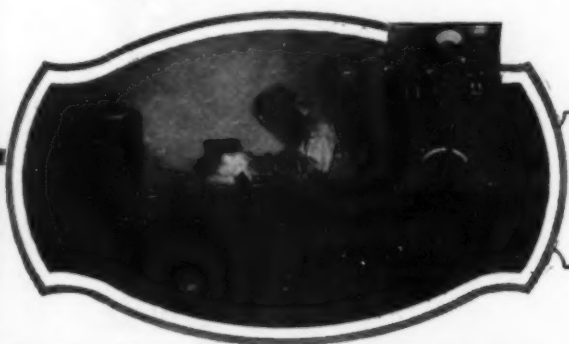
# the more you save

It originated the atomic-hydrogen arc welder. Its great research laboratories and its welding engineers are constantly working to develop new equipment and to discover new applications. Its arc welding school is making an invaluable contribution to better welding practice.

We present here a picture that indicates the completeness and the leadership of G-E arc-welding equipment and arc-welding service. Let the nearest G-E office be your headquarters for your every arc-welding requirement.



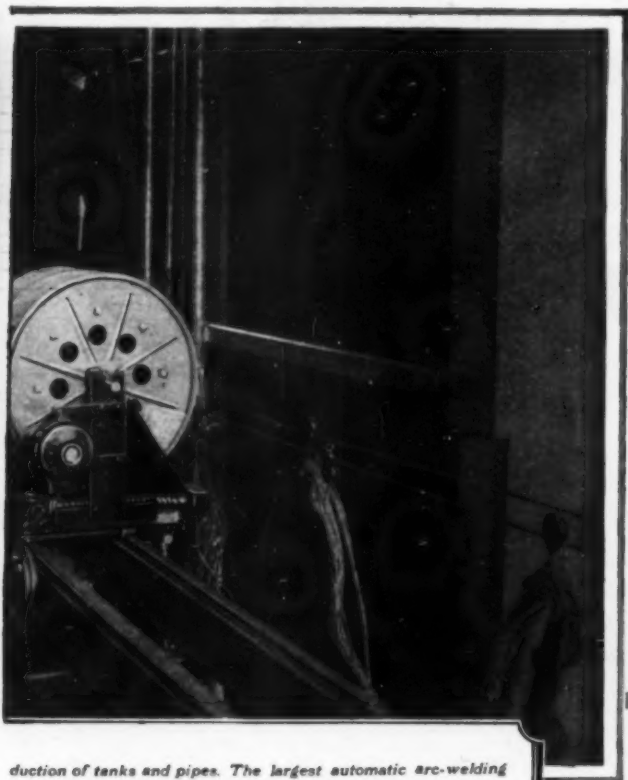
Single-operator sets—for all general welding work. Available in three sizes—200 amperes, 300 amperes, and 400 amperes



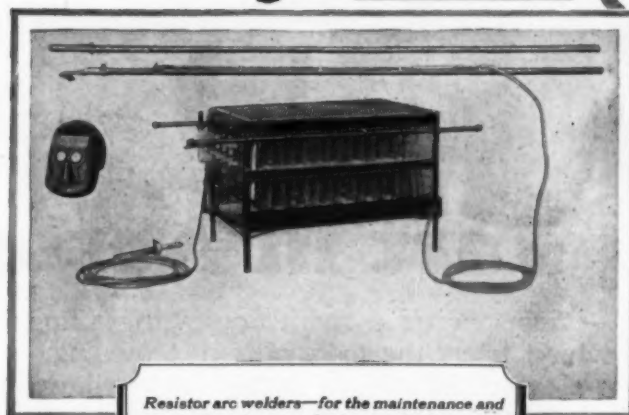
Atomic-hydrogen arc welder—for welding very thin metals or metals and alloys hitherto considered unweldable



Accessories for the welder: helmets, face-shields, electrode holders, welding cable, etc.



Production of tanks and pipes. The largest automatic arc-welding simultaneously weld longitudinal seams on large steel pipe



Resistor arc welders—for the maintenance and repair departments of mines and street railways. Operate directly from trolley circuits



G-E arc-welding school. Free instruction. Conducted in the interest of better welding



530-40

# ELECTRIC

SALES OFFICES IN PRINCIPAL CITIES

# KOEHRING DANDIE



## Fast in Action Because—

— *first* there's a roomy charging skip which takes the load without crowding, and which is correctly shaped for free flow of materials. Its elevating speed is so timed with the action of gravity on materials that there can be no wedging or choking!

*And*, the skip can be loaded from ground level without need for elevating platform!

— *second* — the high narrow drum in this size mixer not only insures fast,

thorough mixing but keeps materials together in position for fast discharge.

This, and the quick discharge control means speed in getting concrete out of the drum, into the forms!

This Koehring Dandie is a Speedster but it is a *long distance* performer too — it's built to stand up to high speed, long service. Not the lowest priced mixer but the outstanding, remarkable value in the field.

*Send for Dandie Catalog D-17*

**Dandie 5-S, 7-S, 10-S** — 5-S single cylinder; 7-S and 10-S two or four cylinder radiator cooled Ricardo head gasoline engine. Rubber tires with disc wheels or steel rimmed wheels. Complies with A. G. C. standards.

A4713-1

**KOEHRING COMPANY, MILWAUKEE, WISCONSIN**

PAVERS, MIXERS—GASOLINE SHOVELS, CRANES AND DRAGLINES

*Sales Offices and Service Warehouses in all principal cities*

*Foreign Dept., Room 579, 50 Church St., New York City*  
*Mexico, F. S. Lapum, Cinco De Mayo 21, Mexico, D. F.*

# NOW

## Features

The Model-R is available with the following attachments:

Standard  $\frac{3}{4}$ -yd. shovel dipper.

Missabe type rock dipper,  $\frac{5}{8}$ -yd. capacity.

Crane boom in lengths of 35, 40 and 45 ft. to handle loads up to 10 tons at 12-ft. radius, and crane buckets from 18 to 42-in. width with maximum digging depth to 20 ft.

Full crawler mounting — long, heavy crawlers with self-cleaning treads.

Fully enclosed steel cab with doors and windows.

Timken roller bearings on high speed shafts.

Climax engine with electric starting equipment.

Zerk-Alemite lubrication connections.

Drums operated by E-Z control clutches.

Travels completely assembled.

Easy steering. One-man operation.

Weight about 26 tons.



## Model-R

### Full-Revolving Convertible Excavator

Here is a new member of the Bay City family—a rugged and compact  $\frac{3}{4}$  yd. convertible shovel, crane or trencher that will soon be as famous as the popular Bay City Tractor Shovel and Model 16-B Convertible Excavator. It weighs about 26 tons, and comes as near being the last word for this type of machine as you will find anywhere.

It does not differ radically from standard and accepted design except in the following: (1) more compact machinery arrangement—only 30 inches from base of boom to center of rotation, (2) new design of crawler steering mechanism permitting quicker and easier steering or turning, (3) machine table revolves on unusually large diameter heavy cast circle mounted on car-body, (4) short tail swing permitting operation in crowded quarters, (5) all parts under revolving base can be lubricated with the Zerk-Alemite connections without operator bending over or getting under the machine.

Look over the other features listed here and write us for full details of Model-R.

**BAY CITY DREDGE WORKS**  
**BAY CITY, MICH.**  
New York Office—302 Broadway

Model-R with 35 ft. crane boom lifting and swinging a Bay City Tractor Shovel (weighs about 9 tons) at 12 ft. radius. Standard counterweight slabs not on machine.

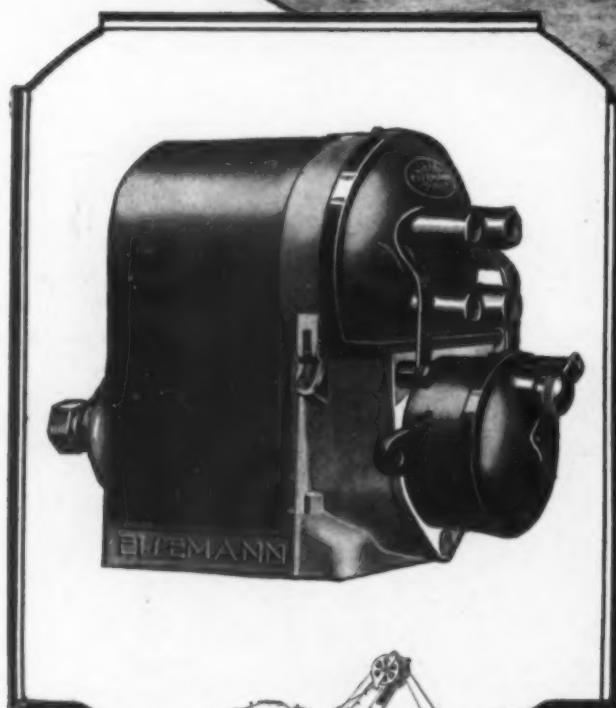
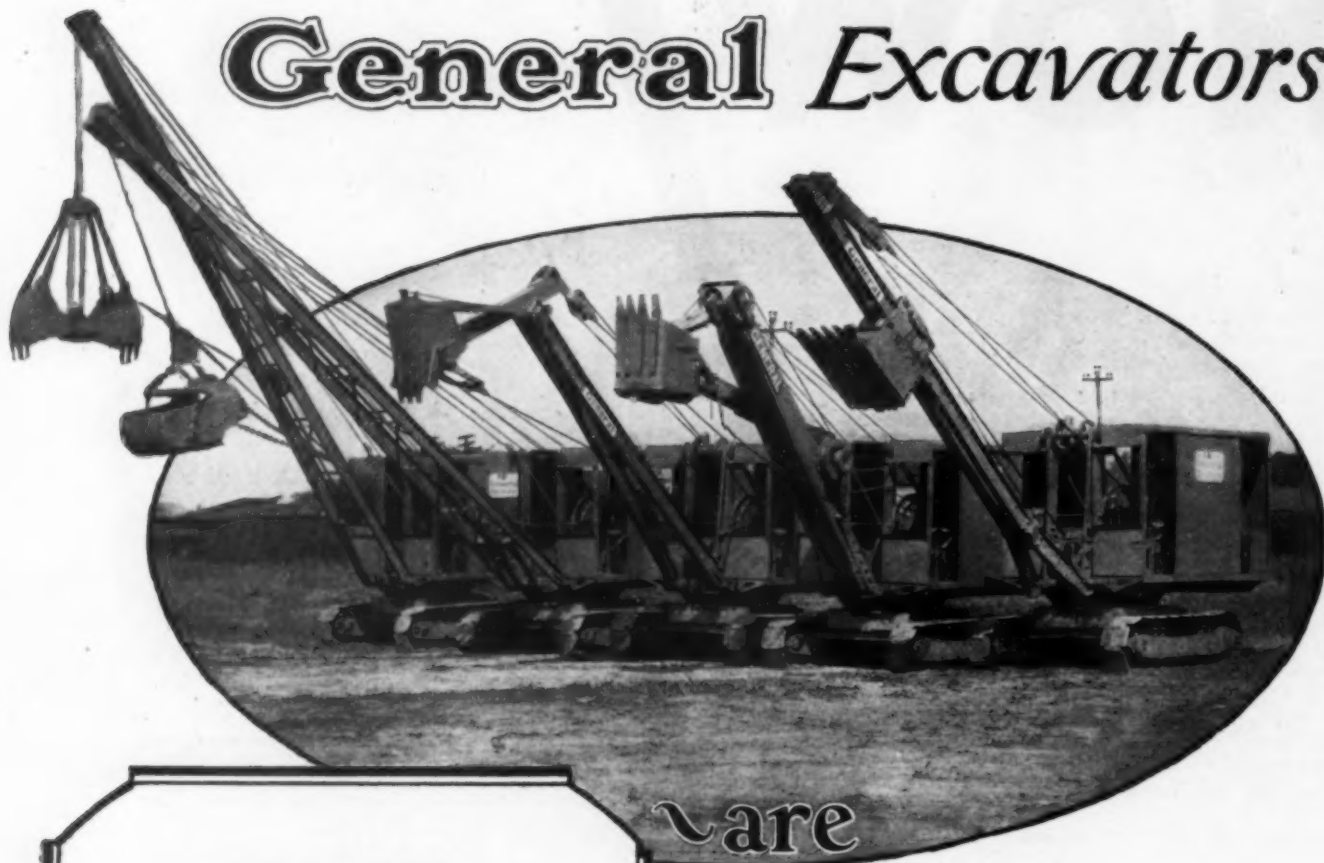
Short Tail Swing

# BAY-CITY

**FULL OR PART CIRCLE —SHOVELS—TRENCHERS—SKIMMERS**



# General Excavators



## Eisemann Equipped!

Buyers of General Shovels can rely upon constant, uninterrupted service from their magnetos. For the ignition system—Eisemann—is a product of the highest quality, built to give years of trouble-free service.

This positive, unfailing dependability is the reason why Eisemann has been selected by the great majority of builders of quality construction equipment.

EISEMANN MAGNETO CORPORATION

165 Broadway - New York

Detroit

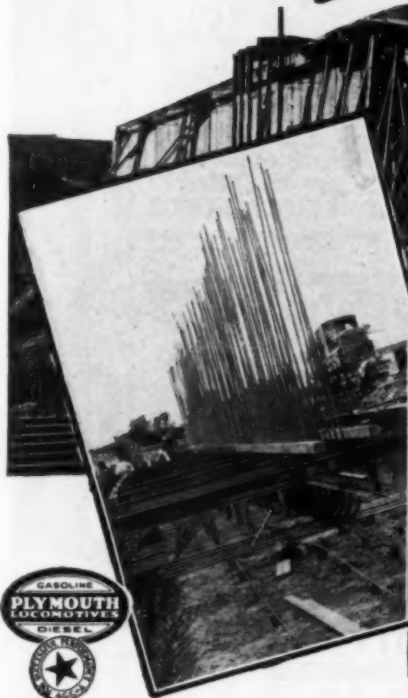
San Francisco

Chicago



# EISEMANN

# Over the Hump!



Missouri Engineering & Contracting Co.  
Incorporated  
St. Louis,  
December 16, 1927

The Fate-Root-Heath Co.,  
Plymouth, Ohio.

Gentlemen:

The job on which the 4-ton Plymouth Locomotive is being used, consists of the construction of 2 sets of Basins for the Missouri River Plant of the St. Louis Water Works. One group consists of a Basin 816 ft. long by 330 ft. wide, with wall about 16 ft. above the top of the footing (this basin has a division wall, dividing it into 2 Basins, each approximately 408x330.) The other consists of Basin 600x100 with wall about 17 ft. above the footing, divided into 4 Basins, each 150x100 ft.

The performance of this Locomotive is entirely satisfactory.

The concrete is mixed at a central plant, using a 1-yard mixer, from which it is loaded into 1-yard cars and hauled to point of application in the Basin, by means of the Plymouth Locomotive. When pouring the footings, three 1-yard cars were hauled per trip, only because of the limited yardage that could be poured at any one time. After a portion of one of the Basin walls had been completed, an incline was built from the ground level to the top of the wall (a vertical height of about 16 ft.) Track was laid on top of the wall and the concrete was hauled up the incline (about an 8% grade) and along the top of the wall, to be deposited in conduits, running parallel to the wall.

Yours truly,  
MISSOURI ENGINEERING & CONTRACTING COMPANY  
*Francis T. Cutts*  
President



## A Plymouth helps build the Missouri River Plant of the St. Louis, Missouri Water Works

Hauling 460 tons of concrete per eight hour day a maximum distance of 1600 feet up an 8 per cent grade with a 5-ton load on an average of 5 gallons of gasoline per day.

The photos show his 4-ton Plymouth Gasoline Locomotive during some of its daily routine over the hump.

The letter reproduced here from Mr. Francis T. Cutts, President of Missouri Engineering and Contracting Company, PLYMOUTH LOCOMOTIVE WORKS tells something of the construction methods employed.

The Fate-Root-Heath Company  
299 Riggs Avenue  
PLYMOUTH, OHIO


The Plymouth line of Gasoline and Diesel Locomotives is complete from 2 to 50 ton sizes. We have some interesting data and installation literature which will be sent to you upon request.

# PLYMOUTH

## Gasoline and Diesel Locomotives



*The open door to better equipment and service!*



**1765  
R.E. BROOKS CO.**

KOEHRING CO.  
INSLEY MFG. CO.  
BLAW-KNOX CO.  
CLYDE IRON WORKS  
NATIONAL BRAKE & ELECTRIC CO.  
A.W. FRENCH CO.  
C.H. & E. MFG. CO.  
HUBER MFG. CO.  
BAY CITY FBY & MACH WKS  
HANDY SACK BALER CO.

**R.E. BROOKS CO.**  
EQUIPMENT for CONTRACTORS  
50 CHURCH ST. CORNER 52nd ST. NEW YORK CITY

*The Bates 70  
operating 12-foot grader*



## Bates Tractor durability

Checking over point by point the design of BATES Tractors, it will be found that long service life and low upkeep cost have been assured by a strong construction of high engineering efficiency. The result is a machine built to deliver the most work with the least wear and tear upon itself.

These are just a few features of the BATES 70

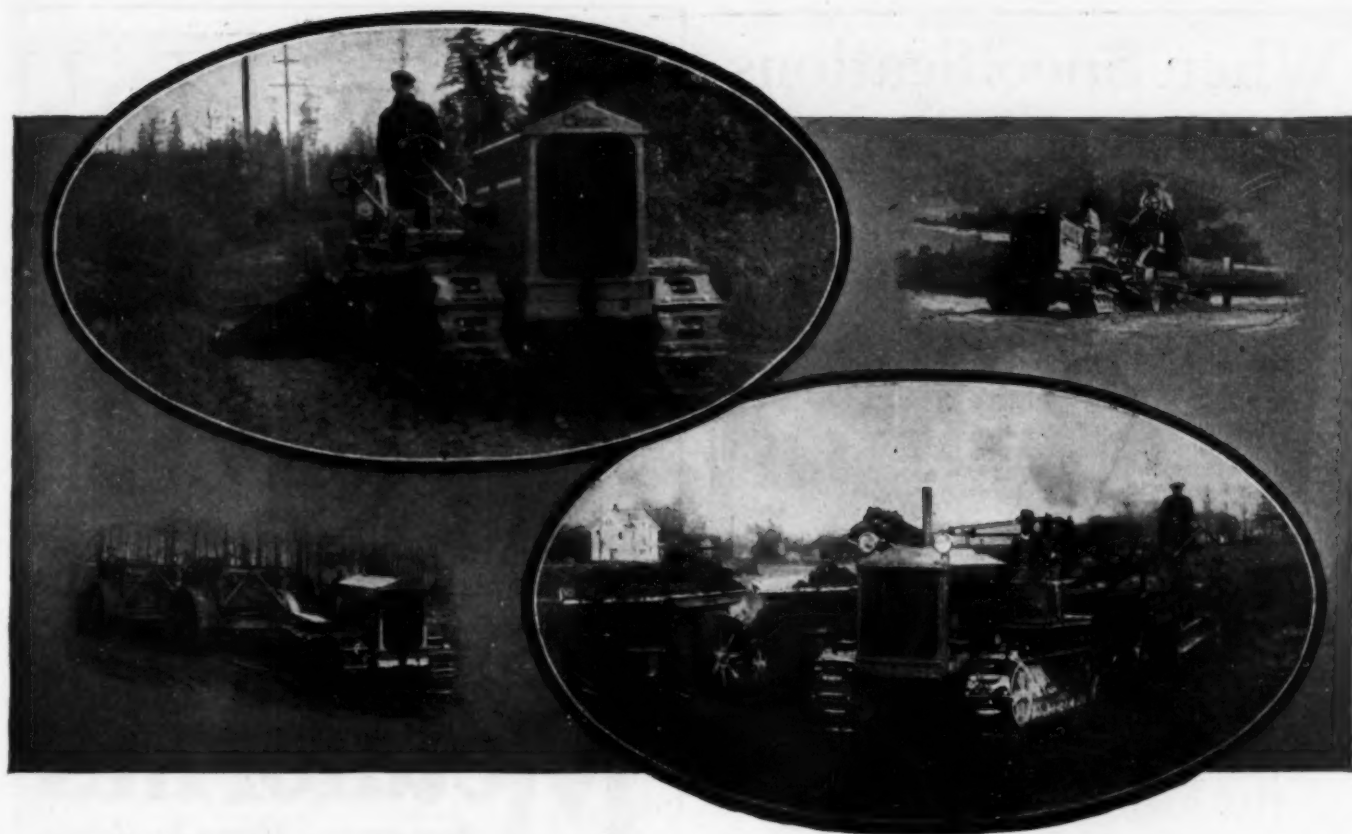
shown above: Underslung swinging drawbar; medium speed 4-cylinder motor with Ricardo Head; Spring shock absorber in drawbar; long crawler ground contact; large diameter truck wheels running on roller bearings, etc.

The BATES 70 is built to handle 12-foot graders and any of the largest tractor tools.

3 sizes: Bates 28—Bates 40—Bates 70

**BATES MANUFACTURING COMPANY, Joliet, Illinois**





## For Every Phase of Road Work— CLETRAC CRAWLER TRACTORS

**H**ERE is a complete line of *quality* tractors that are literally *built to order* for the duties of road work and all industrial operations. No matter what the problems—heavy pulling, deep mud, steep grades, small working space—whatever requirements confront you, on any job, all are met successfully, efficiently and profitably with CLETRAC CRAWLER TRACTORS.

CLETRACS are in a class distinctly by themselves in those features that make for speed, dependability and economy; abundant power with plenty of reserve—sure-gripping traction over any footing—easy steering and short turning—low gas and oil consumption—"One-Shot" instant lubrication.

It will pay you to investigate CLETRACS and the notable work they are doing daily for highway and city departments and for hundreds of contractors and engineers throughout the country. The coupon or a letter will place the complete story before you.

**A complete line of  
Crawler Tractors**



**The Cleveland Tractor Co.  
Cleveland, Ohio**

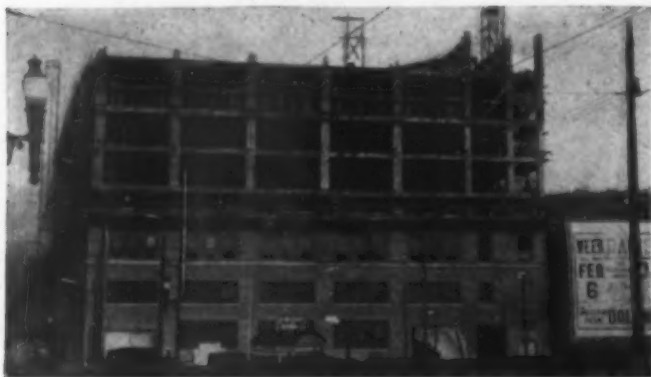
THE CLEVELAND TRACTOR CO. C.M.  
Cleveland, Ohio

Please send literature on Cletracs  
for road building, maintenance, etc.

Name \_\_\_\_\_

Address \_\_\_\_\_

## When Specifications Are Rigid You Find Smith Mixers



*Joseph Horne Warehouse on bank of the Alleghany River, Pittsburgh*

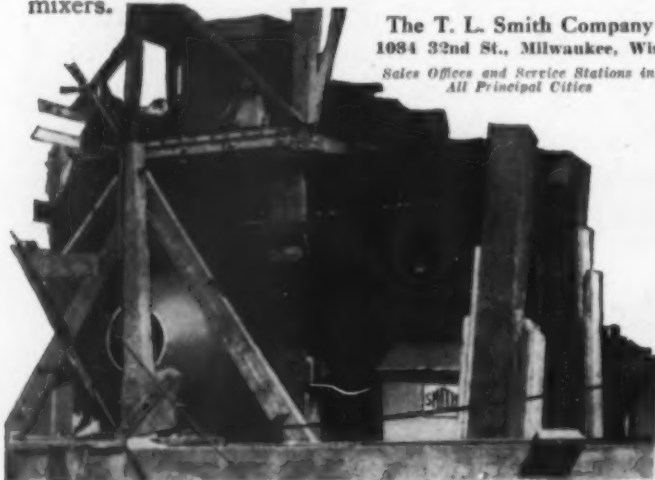
### This Building is Subject to Flood Conditions

The new Joseph Horne Warehouse in Pittsburgh is so located that it is subject to serious flood conditions from the Alleghany River. Its heavy reinforced concrete floor must carry not only a heavy load but also withstand upward thrust at time of floods.

Specifications are very strict and all concrete is inspected and tested thoroughly. A Smith 28-S Tilter was chosen, not only for its known Dependability, but also for its consistently perfect mixing action.

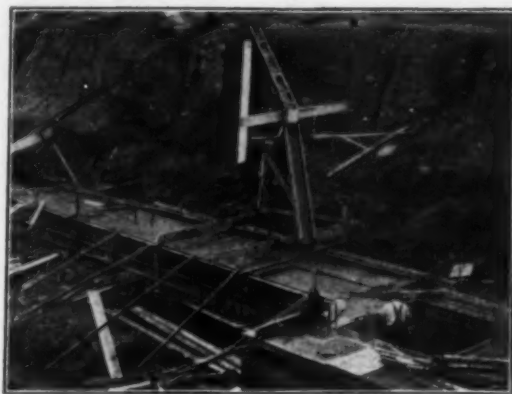
A Smith, in any size from 2½-S up to 112-S, handles dry concrete as easily as wet, mixes it thoroughly and discharges it quickly because of the full width blades and "end-to-center" action. Catalog 528 covers fully all features of these famous mixers.

The T. L. Smith Company  
1084 32nd St., Milwaukee, Wis.  
Sales Offices and Service Stations in  
All Principal Cities



# SMITH MIXERS

## Going Up!

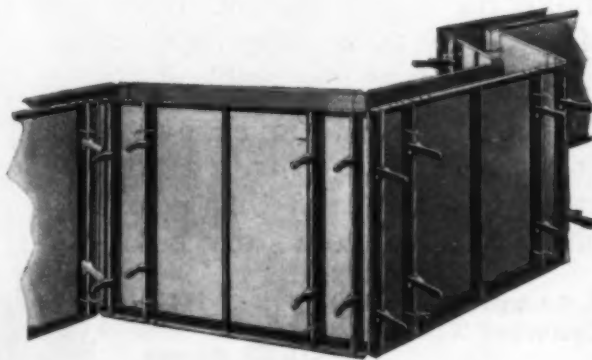


with

## Metaforms *for every form building requirement*

and you can be sure it's going to be a paying job. In fact, Metaforms pay for themselves on every job.

They're steel—reinforced, yet light and easily handled. Standardized too. Those you bought ten years ago will lock tightly and snugly with the new ones. A Metaform outfit will grow with your business.



Let us tell you just what you can do  
with Metaforms on straight wall and  
circular construction

**METAL FORMS CORPORATION**  
**Milwaukee, Wis.**

# **LINE S** (Not Lengths) of Drain Pipe!

**O**NLY separate, isolated *lengths* of *solid-wall* drain-pipe have been familiar in the past, separated to allow water to get inside them and continually becoming less and less efficient in that important respect as dirt-dams have formed between them.

But now actual *lines* of drain pipe are available, with "Poroswall." Its lengths are laid *tightly together*. Its bell and spigot ends fit closely into each other, thus assuring efficient alignment. Its joints may be, and often are, cemented together actually making a *line of one piece*. Its walls are porous—as its name implies—at every point, assuring "A Foot of Drainage for Every Foot of Pipe."

When laid within a surrounding area of crushed stone, "Poroswall" *lines* have ten times the drainage capacity of rows of ordinary, solid-wall, drain-pipe *lengths*. We know of instances where, in three hours after heavy rains, "Poroswall" has completely drained areas which formerly required three days for like results.

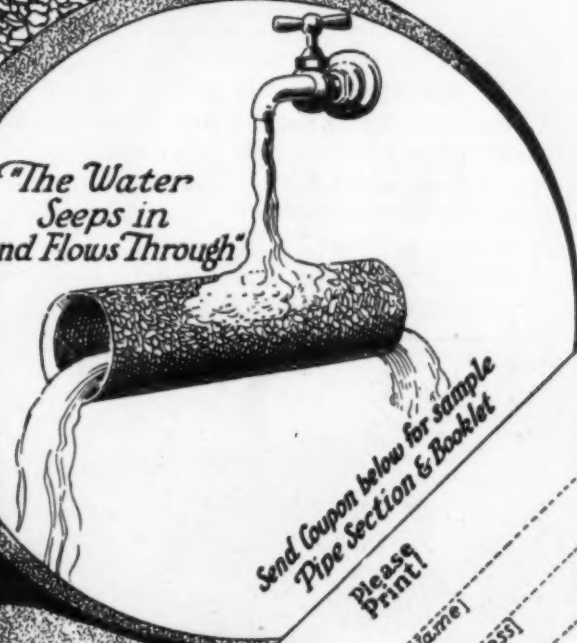
*For Golf Courses, Aviation and Athletic Fields, Sewer Under-Drains, Sewage Disposal Plants, Highways, Swamps and Cellars, etc.*

**WALKER**  
**POROSWALL**  
**RAPID DRAIN PIPE**

Walker Cement Products, Inc.  
 Little Ferry, N.J.  
 Plants at Little Ferry, N.J. & Baldwin, L.I., N.Y.



*"The Water Seeps in and Flows Through"*



Send Coupon below for sample  
 Pipe Section & Booklet

Please  
 Print!

Name

Address





The Famed Witch-Elk  
Engineers' Boot  
Smoked Elk uppers, water-proofed.  
Wing tip. Full leather lined. Full  
bellows tongue. Heavy Oak outsoles,  
water-proofed. Chrome middle soles.  
Flanged heel.

## Scuffed and Waded 13,500 Miles in His Witch-Elk Engineer Boots

In the heap of recently received, friendly letters of praise a man\* from West Virginia writes that he has scuffed and waded 13,500 miles on pipe line inspection in his Witch-Elk Engineers' Boots . . . a distance equal to half way round the world . . . and the boots are still going. He has worn out seven pairs of soles so far but the uppers just will not give up.

This is another factful illustration of the dry, tough, pliable stamina that has made the Witch-Elk boot famous for hard usage in all the punishing, brutal field conditions of the engineer.

Do you want comfortable boot miles free from foot misery? Do you want longer wear with less fatigue from your boots? Then be sure to buy Witch-Elk Boots, designed by specialists for engineers. Made from the finest materials money can buy.

\*Name on request.

*At your local dealer or, if you wish, we'll send you our boot booklet that gives many pointers on good leather boots.*

**Witchell-Sheill Company, Detroit**

*World-Wide Reputation . . . On Fields of Recreation*

## A Rogers Saved \$400 On One Move

"It saved me \$400 on one move," said a man speaking of a Rogers.

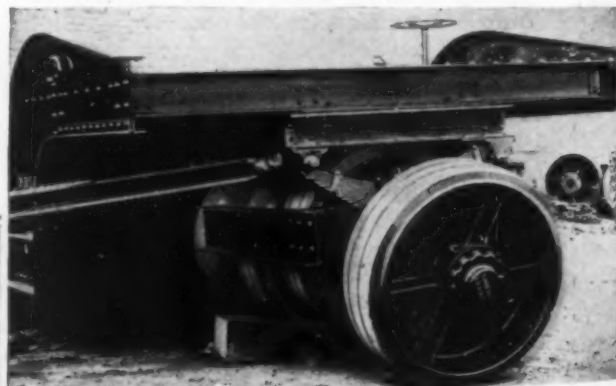
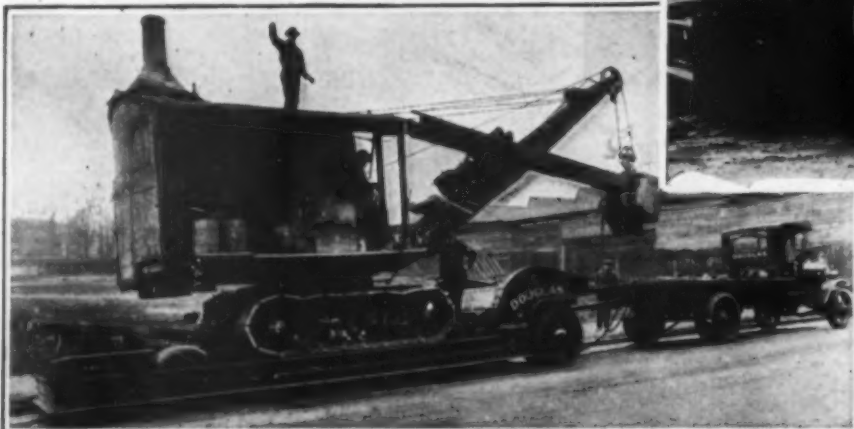
Many contractors can profitably employ Rogers Heavy Duty "Gooseneck" Trailers to move heavy equipment quickly and economically.

Their remarkable roadability results from their short turning radius, more than 90 degrees, and the rocking axles with 8 inches oscillation that level out uneven roads.

The ease with which Rogers Trailers load is striking, and their distinctive design makes possible unusually quick transportation.

*Write for the Rogers story. Find out how utilizing Rogers Heavy Duty Trailers will save you money.*

**ROGERS BROTHERS CORPORATION**  
ALBION, PA.



*Above—Note spring mounting, 90° turning radius for short turns and oscillation of inside front wheels.*

*Left—This shovel was loaded, ready to go, in one minute.*

# nearly $\frac{1}{2}$ of the MultiFootes sold are repeat orders

W. J. Lang  
and associated contractors, Chicago 15 MultiFootes

West Const. Co., Chattanooga, Tenn. 12 MultiFootes

F. J. McGuire, Norfolk, Va. 11 MultiFootes

Wm. P. McDonald, Flushing, L. I. 10 MultiFootes

Highway Const. Co., Cleveland, O. 8 MultiFootes

J. F. Knapp, Turlock, Calif. 3 MultiFootes

J. V. Galarza, Fresno, Calif. 2 MultiFootes

Add these names to those published before and you have a testimonial to paver service that no other paver manufacturer can offer.

**The Foote Company, Inc.**  
of Nunda, N. Y.

*World's largest exclusive builders of road pavers*

Frank E. Hall  
152 W. 42nd St.  
New York City

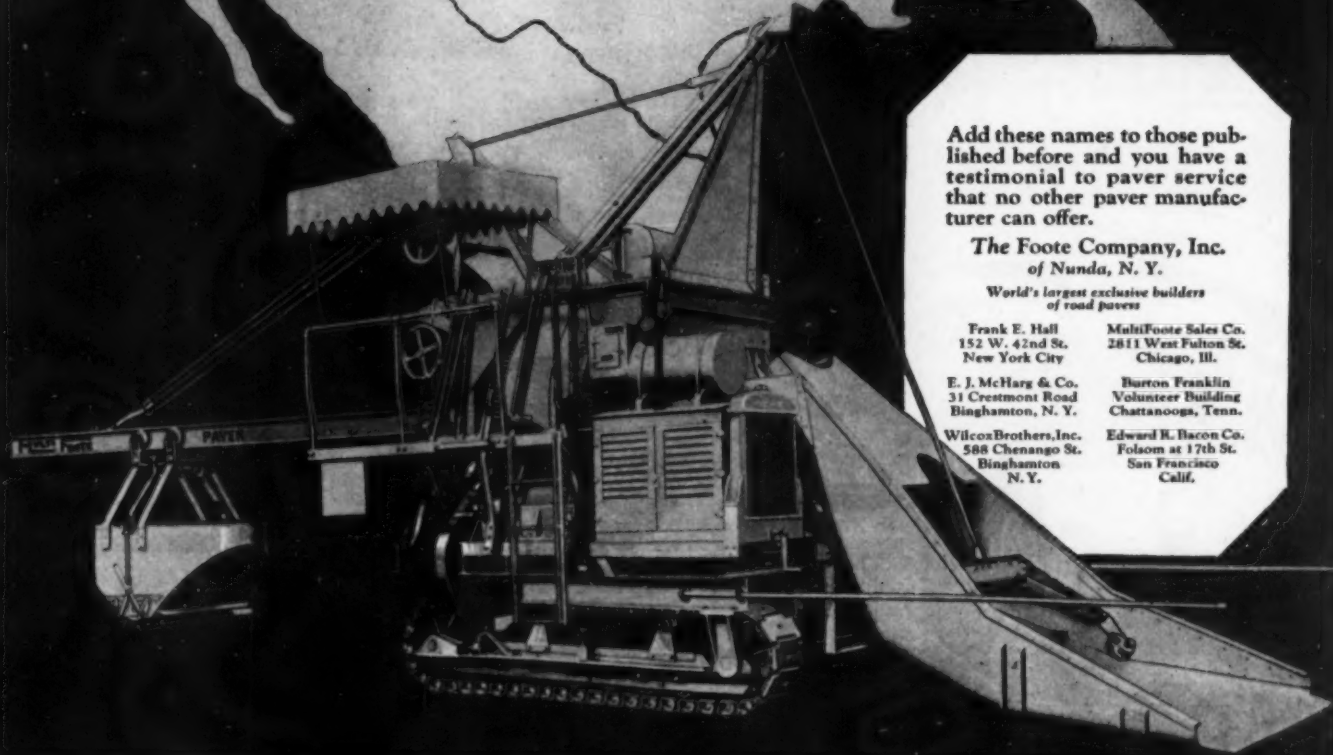
MultiFoote Sales Co.  
2811 West Fulton St.  
Chicago, Ill.

E. J. McHarg & Co.  
31 Crestmont Road  
Binghamton, N. Y.

Burton Franklin  
Volunteer Building  
Chattanooga, Tenn.

Wilcox Brothers, Inc.  
588 Chenango St.  
Binghamton  
N. Y.

Edward K. Bacon Co.  
Folsom at 17th St.  
San Francisco  
Calif.



C.M.7-Gray

**T**HE USEFULNESS of a Browning is unlimited! Any place there is handling to be done a Browning Truck or Crawler Crane will get it done faster and more economically. And Browning speed and economy is matched by Browning long life and low maintenance.

**THE BROWNING CRANE COMPANY**

16226 Waterloo Road  
CLEVELAND, OHIO, U. S. A.

New York : Chicago : Pittsburgh : Birmingham

**SALES AGENTS:**

Jacksonville : Los Angeles : New Orleans : Baltimore  
Portland : Boston : Montreal : Toronto : Houston



A Browning Crawler Crane on a Chicago construction job for C. H. Jenswold Steel Erecting Co.

**STEAM - GAS - ELECTRIC  
LOCOMOTIVE - TRUCK - CRAWLER - CRANES  
BROWNING**

Driving Rains and Salt Sea Air Cannot Penetrate or Stain  
These Brick Walls—They're Waterproofed with  
"ANTI-HYDRO"



**A**LTHOUGH this large hotel is situated on the ocean front at Asbury Park, New Jersey, the walls are always dry and the brick cannot stain from efflorescence coming from the mortar joints. That's because the cement mortar is mixed with "ANTI-HYDRO."

Driving rains, wintry winds and salt sea air have no effect on this masonry.

"ANTI-HYDRO" waterproofs and dampproofs portland cement mortar and concrete *permanently*. Its small additional cost guarantees dry and stainless walls and is a profitable investment for any building, large or small.

Being a liquid compound which mixes readily with water, "ANTI-HYDRO" is extremely easy and economical to use. No additional labor is required for the mixing. And in addition to its many other advantages, "ANTI-HYDRO" makes cement mortar extremely plastic so that it spreads more easily. "ANTI-HYDRO" has been in continuous use for 24 years. It will pay you to use it on your next brick job.

**ANTI-HYDRO WATERPROOFING CO.**

265-269 BADGER AVE.

NEWARK, N. J.



BERKELEY CARTERET HOTEL, ASBURY PARK, N.J.



WARREN & WETMORE, ARCHITECTS - TURNER CONSTRUCTION CO., CONTRACTORS.



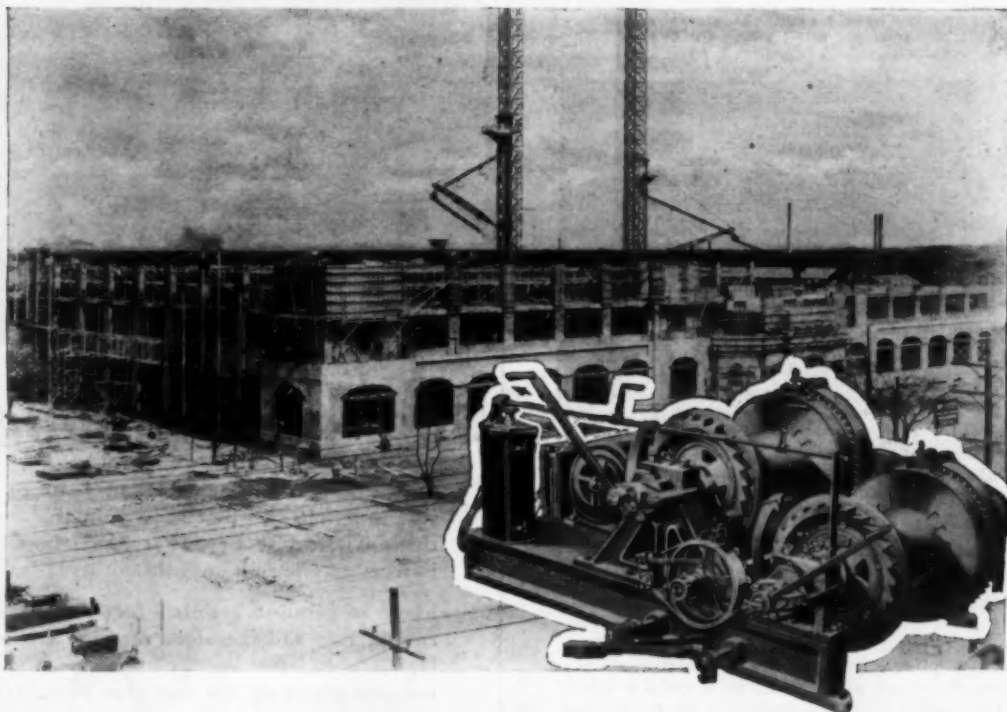


# HOISTS CLYDE DERRICKS

The illustration below shows a Clyde 80 H. P. two-drum electric hoist operating both towers on the new \$2,000,000, eight-story distributing house for Montgomery, Ward & Co., at Fort Worth, Texas. Thomas S. Byrne, Inc., has the general contract for the structure.

Clyde hoisting units, regardless of motive power incorporate every proven device that tends to safety and economy in operation.

*You'll take Pride in your Clyde!*



## CLYDE IRON WORKS SALES CO.

DISTRIBUTORS FOR CLYDE IRON WORKS DULUTH, MINNESOTA

NEW ORLEANS: 309 MAGAZINE ST.  
NEW YORK CITY: 858 EAST 136TH STREET  
PORTLAND, OREGON: 555 THURMAN ST.  
SEATTLE: 3410 FIRST AVENUE SOUTH  
VANCOUVER, B. C.: STANDARD BANK BLDG.

— BRANCHES —

CHICAGO: 11 SOUTH LASALLE STREET  
CINCINNATI: 201 W. PEARL ST.  
MEMPHIS: 69 UNION AVENUE  
JACKSONVILLE, FLA.: 112 W. ADAMS ST.  
DALLAS: 508 REPUBLIC BANK BLDG.  
OMAHA: 1003 FARNHAM ST.



TWO MARKS OF



GUARANTEED QUALITY



# They're Auto- matically Primed

with a Type and Size  
for Every Pumping Job



Type MEP Centrifugal Pump—Automatically Primed. Furnished complete including LeRoi engine. Built to stand the gaff of continuous service, yet light weight. Six sizes; capacities to 1,200 gals. per min.; suction lifts to 20 ft. Low priced.



Barton Centrifugal Pump — Automatically primed. Attaches to front of any car or truck and automobile engine drives it. Dependable; light weight; does not interfere with driving. Five sizes; capacities to 900 gals. per min.; suction lifts to 20 ft. Low priced.

**T**ODAY contractors, the country over are saving time, eliminating grief with American-Marsh Pumps. The patented Automatic Primer furnished without extra cost on every one of these pumps is a sure-fire device that always functions. In less than one minute you're handling water—no attention required—no idle crews—no \$3 to \$5 per day for a man to watch pumping operations.

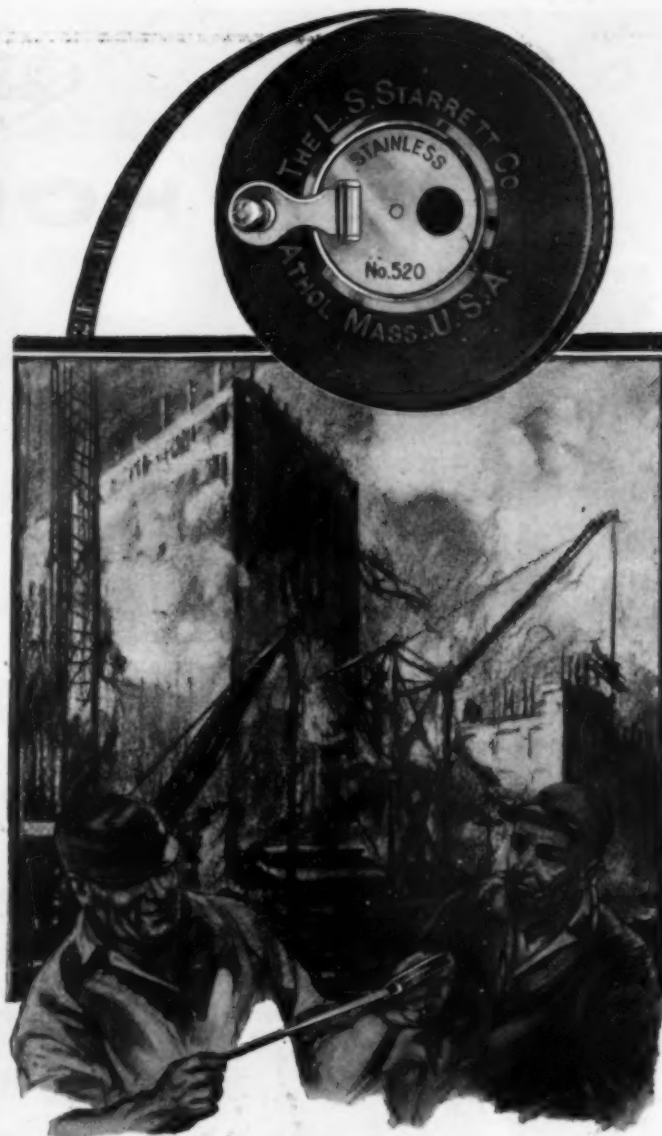
Turn to American-Marsh and cut your pumping costs! Use coupon below, checking as interested.

## AMERICAN-MARSH Contractors Pumps

AMERICAN STEAM PUMP COMPANY  
BATTLE CREEK, MICHIGAN.

- ☐ Send Bulletin 59 on Type MEP Pumps.  
☐ Send Bulletin 56 on Barton Pumps.

Name .....  
Address .....



## The tape for tough jobs

On those muddy foundation jobs or around salt water—conditions that soon ruin the average tape—that's where the Starrett Stainless Steel Tape is worth its weight in gold.

Made of genuine Stainless Steel, this Starrett Tape cannot rust and therefore remains bright and clearly legible even after years of service. A quick wipe to remove grit is all the care this Starrett Tape ever requires.

Your dealer will gladly show you the Starrett Stainless Steel Tape No. 521, graduated in feet, tenths and hundredths of a foot—in 50 and 100 ft. lengths. And the No. 520 in the same lengths, graduated in feet, inches and eighths of an inch.

Write us for the Starrett Catalog No. 24 "NF"

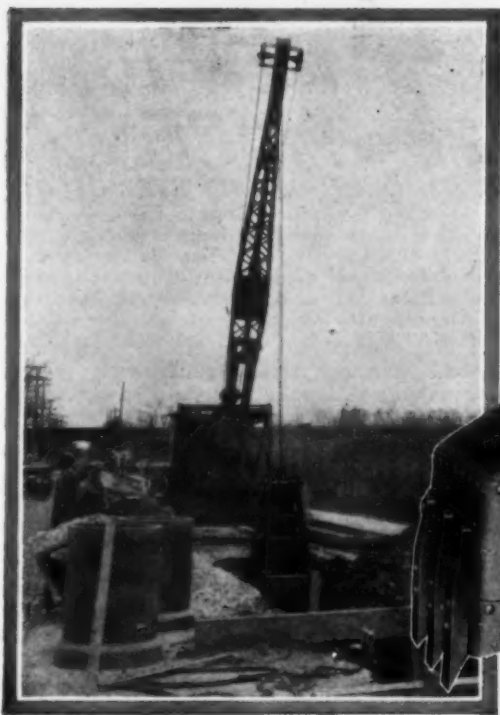
THE L. S. STARRETT CO.

World's Greatest Toolmakers  
Manufacturers of Hacksaws Unexcelled  
Steel Tapes—Standard for Accuracy  
ATHOL, MASS., U. S. A.

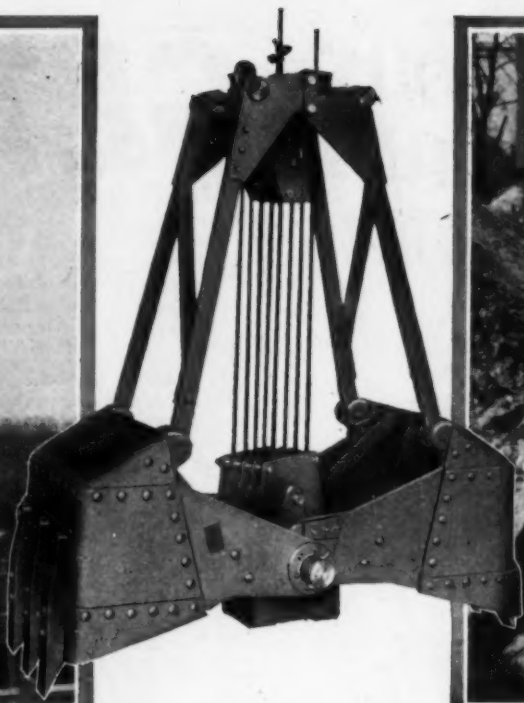
2000

## Use Starrett Tools

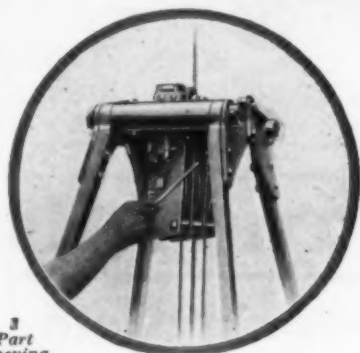




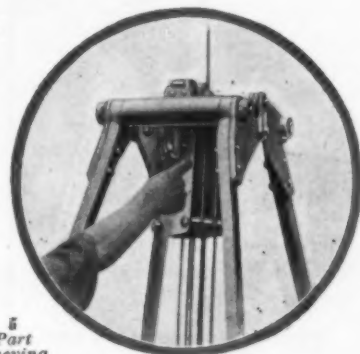
Hayward Class K Clam Shell digging trench for drain pipe, Hackensack Athletic Field, Hackensack, N. J.



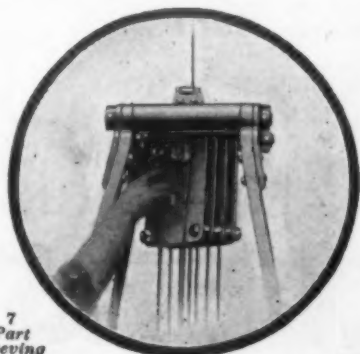
Hayward Class K Clam Shell digging trench in city street, Brooklyn, N. Y.



3 Part Reeving



5 Part Reeving



7 Part Reeving

## It needs very little "breathing space"

A HAYWARD Class K Clam Shell Bucket digs in narrow trenches where very little "breathing space" is available. See in these pictures how it works under space restrictions.

A Hayward Class K is a 3-in-1 bucket. Fitted with 5 part line reeving ready for any ordinary digging a clam shell will do, for rehandling large,

loose, bulky materials up to 3" crushed stone, etc. A simple change to 7 part reeving fits the bucket for extra hard digging, while a reduction to 3 parts line makes it an efficient re-handling bucket.

Send for bulletin No. 653. Or talk over this new bucket with a Hayward engineer.



THE HAYWARD CO.  
44 Dey St., New York, N. Y.

# Hayward Buckets



*When your job  
is miles away  
from water!*

## BARNES PUMPS

*prove most  
profitable*

Barnes Triplex Road pumps fully demonstrate their value when the job is miles away from water.

Built for high working pressures, they deliver an unfailing supply of water for all operations over extremely long distances irrespective of high elevations.

The features below show why "break-downs" so frequent with many pumps do not occur when Barnes are used.

- |  |   |
|--|---|
| 1—Most simple, self-oiling system—one moving part rotary pump. | 5—Roller bearings on all shafts, including crank shaft.                           |
| 2—All steel gears.   | 6—Water cylinders detachable from power end.                                      |
| 3—Forged crank shaft—not cast.                                 | 7—Flexible coupling between pump and engine.                                      |
| 4—Three point suspension truck, spring mounted.                | 8—Rubber-tired roller bearing wheels, interchangeable with standard steel wheels. |

Capacity 80-100-125-150 Gals. per Min. Pressures up to 500 Lbs.

**The Barnes Manufacturing Co.**  
923 Main Street, Mansfield, Ohio



The Barnes Manufacturing Company,  
923 Main St., Mansfield, Ohio

Please send me complete descriptive literature covering Barnes Road Pumps.

Name .....

Address .....

City ..... State .....

## GET NEW LOW PRICES!

HIGHEST QUALITY CONSTRUCTION EVER USED

Amazing factors of strength and efficiency. Compare the BOSS Drum with the mixing drum of any outfit within \$250 of its price. All steel, electrically welded, leak proof; 800-lb. less dead load for engine. Steel castings and forgings where strain is great. Hyatt Bearings save power and oil. Massive semi-steel gears. Alemite lubrication. Learn all the BOSS means to you.

### High Speed Mixing and Discharge

Patented re-mixing action produces exceptionally strong, uniform aggregate—10 cu. ft. per batch. Finger touch discharge action—8 to 12 seconds. 10-12 h.p. multicylinder Novo and LeRoi engines. A fast-working, dependable outfit at a price that's RIGHT. Easy To Buy.



## THE BOSS ONE-TWO BAGGER MIXER

**Act NOW!**

Look into this. Write today for money-saving facts and prices.

BOSS Mixers are built in all sizes and types.

BOSS Hoists—Single and Double Drum.

**Write Today!**

**AMERICAN CEMENT MACHINE CO., Inc.**  
243 South Fourth Street KEOKUK, IOWA

## REPUTATION

### Buffalo-Springfield Rollers

are in more general use than any other make—best evidence that the men who build our roads and streets prefer them.



Motor and steam three-wheel rollers. Motor and steam Tandem rollers. General Duty Maintenance Rollers.

All practical sizes. Scarifier and other attachments optional.

*Illustrated literature ready to mail.*

**The Buffalo-Springfield Roller Co.**  
Springfield, Ohio

## Buffalo-Springfield ROLLERS

DEPENDABILITY and PERMANENCE • • The True Measure of Quality in Portland Cement



**T**WO great elevators, in two cities, erected twelve years apart for two railroads, were built by one contractor of one portland cement, Atlas. (Experience on the Pennsylvania Railroad's Girard Point Elevator, built in 1915 at Philadelphia, proved to James Stewart & Company, Incorporated, the dependability and permanence of Atlas. The irrefutable testimony of time counseled its repeated choice for the Wabash Railway Elevator, built last year at Kansas City. (For every type of construction in which portland

cement is used, Atlas has established its unfailing quality. From canal and causeway to curb and column, it has earned its place as "the standard by which all other makes are measured."

*It is gratifying to see among the Atlas records the names of so many contractors who have shown a continuous and increasing preference for Atlas Portland Cement. They tell us that besides their knowledge of its dependability, the public good-will enjoyed by Atlas is an asset of value. Clients, familiar with Atlas color advertising in the national magazines, nod approval when they see Atlas bags on the job. The Atlas Portland Cement Company, 25 Broadway, New York.*

# ATLAS PORTLAND CEMENT GRAY & WHITE

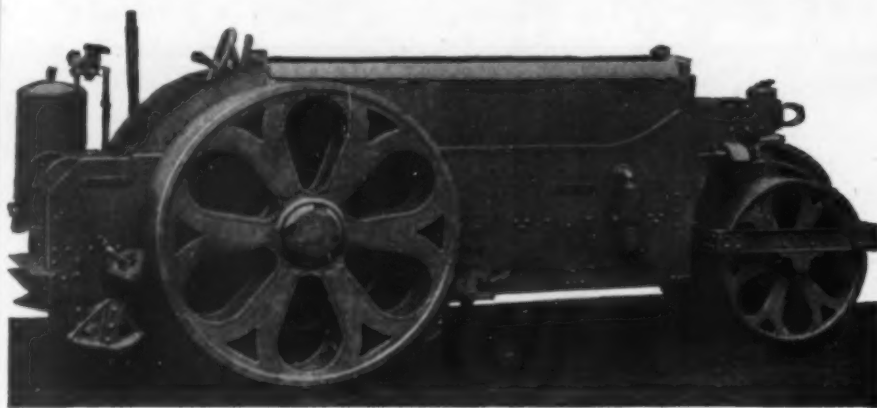
Main Offices: New York • St. Louis

NEW YORK • ST. LOUIS • CHICAGO • BIRMINGHAM • KANSAS CITY • PHILADELPHIA • BOSTON • DES MOINES • OKLAHOMA CITY • OMAHA • ALBANY



*In 1927, the 1,100,000 bushel Wabash Railway Elevator (above) was erected at Kansas City. In 1916, the equally large Girard Point Elevator (at right) of the Pennsylvania Railroad was built at Philadelphia. Both by the same contractor. Both of Atlas Portland Cement.*

*To those who need special speed in construction and early use of completed work, The Atlas Portland Cement Company offers Atlas LUMNITE Cement, through an arrangement with its affiliated company, The Atlas Lumnite Cement Co. Lumnite is not portland cement. In 24 hours it produces concrete which exceeds in strength the 28-day concrete of portland cement.*



# HUBER

## 4 CYLINDER MOTOR ROLLERS

Powerful and dependable, quick in action, economical to operate. Made in 4 sizes (5-7-10-12 Tons). Send for Huber Motor Roller Catalog.

THE HUBER MFG. CO.  
315 E. Center St., Marion, Ohio



## Daylight for Night Work at Lowest Cost

*Important to Investigate the operating cost of your lights. The Milburn furnishes daylight for only 3-1/3 cents per hour.*

Milburn Portable Carbide Lights are used by leading contractors who overlook no opportunity to make every saving that can be effected without sacrifice of efficiency.

Patented features, found only in Milburn Lights are responsible for these economies. Here are a few of these points:

1. THEY FURNISH DAYLIGHT FOR ONLY 3 1/3 CENTS AN HOUR.
2. They burn either lump or cake carbide.
3. Light can be turned off for any period and relit WITHOUT LOSS OF CARBIDE.
4. The work absolutely automatically.
5. They do not require a change of water when recharging the light.
6. They are practically self-cleaning.
7. They cannot be overcharged.
8. They combine all the good points of other lights with numerous exclusive patented features found in no other lights.

Let Milburn Carbide Lights save money for you too. Get full details.

Ask for Booklet No. 2497

THE ALEXANDER MILBURN COMPANY

1416-1428 W. Baltimore St., Baltimore, Md.

*If interested in reducing cost of painting or cutting and welding, ask for information on these subjects, also.*

They  
all  
say—  
O.K!



## The MODERN

way to hoist  
materials—

The O.K. Portable  
Elevator

This elevator *grows with the building!* 10-ft. sections can be added as the job requires. Will lift Brick, Plaster, Steel Members, etc., etc., and save money in labor.

Powerful, dependable engines; large, sure-grip brakes; easily controlled. You need this elevator. You won't be without one after you watch it work! Get the dope—*now.*

*(Some valuable territory open to agents. Write.)*

Investigate O.K.  
Portable Air Compressors  
and  
O.K. Portable Hoists

O.K. Clutch and Machinery Co.

P. O. Box 305, Columbia, Penna.



# HUMDINGER PUMPS

Non-clogging, everlasting rubber ball valves, totally enclosed, running-in-oil jacks, bronze bushed bearings, all steel trucks, and enclosed engine crank cases make HUMDINGER PUMPS.

## THE CONTRACTOR'S CHOICE

Full detail description given in Bulletin No. 1034 CM. Send for a copy.

RALPH B. CARTER CO., 126 Chambers St., New York

Factory: Hackensack, N. J.



A MOUTHFUL  
*and more*



AT EVERY BITE  
*Bites per Day*



Here's an Owen for you, making short work of a real digging job for a clamshell bucket... forced to work between close bracing—must dig straight down in the same hole—can't be placed over the ridges. Note also, the construction is designed so that no part of the bucket can catch on the braces.

A working example of why so many Owens are used in this class of service, doing even better than carrying out the Owen Guarantee of "a bigger day's work than any other bucket of same weight and capacity." The more difficult the digging job, the more reason to use an Owen.

A request will bring you the new Owen catalogue.

THE OWEN BUCKET COMPANY  
6023 BREAKWATER AVENUE  
CLEVELAND, OHIO



# Owen Buckets

# CONTRACTORS

*make use of the*

## LOWELL

### Reversible Ratchet Wrench

*In Many Different Ways*

Every pattern shown below is in actual use by the contractors of this country.



**Lag Screw Pattern**

Finished in black enamel with socket openings both hexagon and square from  $\frac{1}{2}$ -in. to  $1\frac{1}{2}$ -in. across the flats.



**Steel Socket Bridge Pattern**

Finished in black enamel with socket openings both hexagon and square from 1-in. to 5-in. across the flats.



**Multiplex Set**

No. 1—Capacity  $\frac{1}{4}$ -in. to  $\frac{3}{4}$ -in. inclusive.  
No. 2—Capacity  $\frac{3}{4}$ -in. to  $1\frac{1}{4}$ -in. inclusive.  
Expressed in both diameters.

Write for Catalogue M, inform us as to your line of work, and we will tell you how others in similar lines are profitably using

**LOWELL REVERSIBLE  
RATCHET WRENCHES**

**LOWELL**  
**WRENCH CO.**  
WORCESTER, MASS., U. S. A.



Save \$200 over ordinary mixers on Jaeger's One Bag **SPEED KING!**



**TILTERS with LOADERS**  
3½, 5, 7, 10, 14 Ft. Sizes  
**TRAILERS, . . \$169 up!**

**YOU'LL** make records with this compact, end discharge, all-purpose mixer. Trails on dual tires and springs; equipped Accurate Measure Water Tank, Skip Shaker, 100% Roller Bearing. Speed to the job—speed on the job.

Get our catalog, prices, terms on non-tilters, 7 to 28 ft. All models.

**THE JAEGER MACHINE CO.**  
800 Dublin Ave. Columbus, Ohio

To make your unwatering and water supply problems easier!

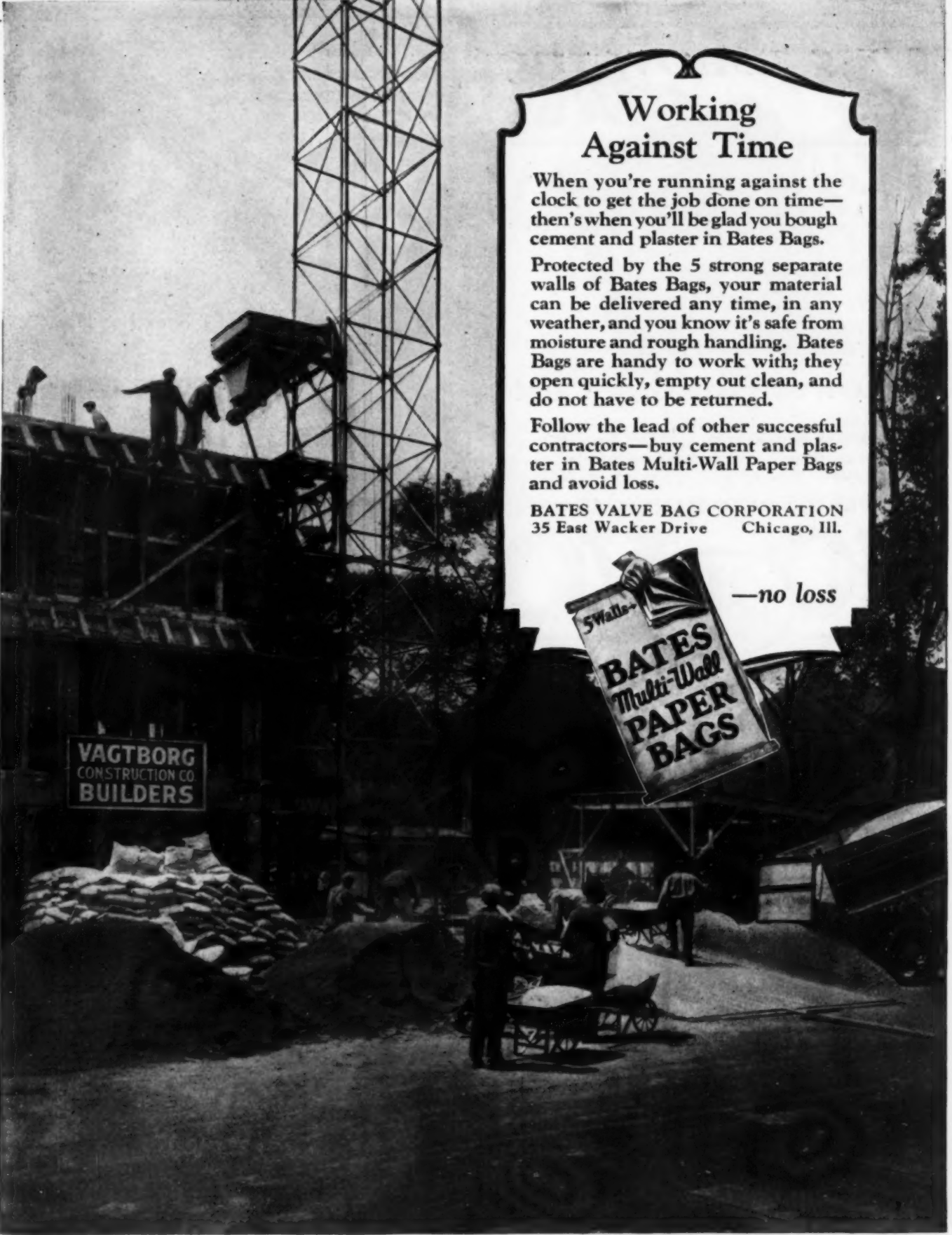


**THIS** Morris Portable All-Purpose Pump handles anything from clear water to floating dirt, sand and gravel, delivers 300 to 600 gals. per min., can be used for heads up to 50 ft., and is easy to cart from one job to another. For general water supply, unwatering excavations, sumps, etc., it can't be beat.

*Write for literature about this and other sizes of Morris Pumps*

**MORRIS MACHINE WORKS, Baldwinsville, N.Y.**

**MORRIS**  
**CENTRIFUGAL PUMPS**



## Working Against Time

When you're running against the clock to get the job done on time—then's when you'll be glad you bought cement and plaster in Bates Bags.

Protected by the 5 strong separate walls of Bates Bags, your material can be delivered any time, in any weather, and you know it's safe from moisture and rough handling. Bates Bags are handy to work with; they open quickly, empty out clean, and do not have to be returned.

Follow the lead of other successful contractors—buy cement and plaster in Bates Multi-Wall Paper Bags and avoid loss.

BATES VALVE BAG CORPORATION  
35 East Wacker Drive Chicago, Ill.

—no loss

VAGTBORG  
CONSTRUCTION CO.  
BUILDERS

Fast work on a 7-story apartment in Chicago. Vagtborg Construction Company, Contractors. Work here progressed regardless of weather conditions

# BATES *Multi-Wall* PAPER BAGS

Bates Multi-Wall Paper Bags are made by the Bates Valve Bag Corporation in 8 modern plants throughout the country



# 2¢ Show the Way



## to Lower Hoisting Costs

This booklet is a collection of hoisting jobs from all over the country—on all types of work. Given in detail by pictures, facts and figures—they point the way to better, cheaper hoisting methods. Send for your copy today—no obligation.

NOVO ENGINE COMPANY 214 Porter Street LANSING, MICHIGAN

**NOVO**  
Clarence E. Bement Vice-Pres. & Gen. Mgr.



Use it also as  
Trench Hoe  
Clamshell  
Backfiller  
Dragline  
Crane



One Man  
Gasoline  
Shovel or Hoe

## FUNDOM SHOVEL Wizard of Modern Diggers

Full  $\frac{3}{4}$  circle swing.  $\frac{1}{4}$  yard dipper water level.  $16\frac{1}{2}$  ft. radius with boom at  $45^\circ$ . Alemite lubrication. Highest class construction. Fast, powerful, rugged, efficient. Powered by a Fordson. Furnished with regular dipper bucket or with trench hoe or with boom extension.

Write us for information and name of nearest dealer.

The Fundom Hoist & Shovel Co.  
407 American Bank Bldg., Lima, Ohio



## For the man who borrows your copy of "CONSTRUCTION METHODS"

We all know him. He doesn't mean to bother you. He really means it when he says he'll return your copy.

But you know that, for some reason or other, he seldom does.

Give this man the coupon. Tell him for \$1, he can get his *own* copy each month for the next two years.

### USE THIS COUPON—Clip here

CONSTRUCTION METHODS  
Tenth Ave. at 36th St., New York, N. Y.

ENCLOSED FIND ONE DOLLAR  
ENTER MY 2-YEAR SUBSCRIPTION TO  
CONSTRUCTION METHODS

Name .....

Address .....

City ..... State .....

Company Employed by or Business Connection .....

Nature of Business ..... Title .....

ACCEPT NO SUBSTITUTE

# Sterling



**"handle clamps" reinforce the handles — no breakage — longer life — therefore far cheaper per job.**

Sterling handles fit into the steel channel leg frame snugly and are held by a reinforcing clamp surrounding both. There's no weak point, here, as is found in bolted handles.

Sterling wood barrow frames are made of selected clear high grade maple, smoothly planed on all sides and grooved along the lower edge forming a seat for the channel leg, the wheel support and metal tip. Bolt holes are drilled at dead center and equally spaced so that any handle may be used for right or left side. Sterling handles being completely interchangeable simplify ordering of repairs and create a saving of time and money.

Sterling barrows *always cost less per job*. If you doubt it—try them out on your next job—compare them with any other—you'll find them better and you will get more work out of them.

#### SPECIAL STERLING FEATURES

Self-lubricating bearings	Selected maple handles
10-spoke wheel	Special tubular steel handles
Malleable iron brackets	Handles clamped — not bolted
Smooth wheel face	Top of tray reinforced
Wrought steel hub	Channel steel legs
Riveted and cast to hub spokes	Riveted leg braces
Fixed rolled steel axle	Extra leg shoes
"V" front tray braces	Wrought iron handle tips

All parts interchangeable

*Buy by Sterling name—leading hardware and equipment dealers have them or they can get them quickly from our complete stock warehouses at Chicago, New York, Philadelphia, Pittsburgh, Cleveland, Detroit, St. Louis*

## STERLING WHEELBARROW COMPANY

Milwaukee

Wisconsin



—and they sure do last

"I know Marsh-Capron mixers are faster, but do they last?"  
 "They sure do! Samuel Mills, of Escanaba, Michigan, is still using his after seventeen years. My own three-year old 7S turns out concrete like new. Hot-ripped steel frame, Timken bearings, rail tracks, a guaranteed drum—Marsh-Capron is the sturdiest mixer made."

**The Marsh-Capron Co.**

11 So. LaSalle St., Chicago

3½S—5S—7S—10S

14S—21S and 28S

Tilters and non-tilters



## Pay Roll Savers



Baker Maney's taking some big loads.

### **BAKER MANEY** Self Loading Scrapers

With a pay-roll of only two or three men, you can move as high as 500 to 600 yards a day with a full train of Baker Maney Scrapers. Powerful—easily operated—short turning, they are practical excavators with a long and successful record.

Write for Bulletin No. 251

**The Baker Manufacturing Co.**

568 Stanford Ave., Springfield, Ill., U. S. A.

## **IRON MULE**

TRADE MARK REG. U.S. PAT. OFF.

### The Original 2 Yard Tractor Dump



#### 4 Iron Mules

Move 1,000 Yards a Day!

HERE'S another earth-moving record for the Hughes-Keenan Iron Mule—the short haul marvel that slices earth moving costs wherever used.

On Ohio State Route No. 70, 4 McCormick-Deering Iron Mules fed by a 1½-yd. shovel moved 1,000 yards every 10 hours for the Holmes Construction Company, Wooster, Ohio. And—every haul was 450 feet.

Ten 2½ yard loads per hour for each unit! That's low cost hauling with a vengeance.

The new Iron Mule consists of husky 2 yard (2½ yard with crowned load) gravity dump body mounted on a powerful 10-20 McCormick-Deering tractor. Going that stumps trucks never checks the Iron Mule's go-ahead traction.

Write for information, nearest distributor and contractor near you who has one.

THE HUGHES-KEENAN CO., Mansfield, Ohio

## **HUGHES-KEENAN**

Steel Dump Bodies



---

# AGAIN and AGAIN you have shattered our tonnage record each month!

**T**HAT each successive month establishes a new tonnage record for shipments of *Carey Elastite Expansion Joint* is, of course, very gratifying to us. That the nation's leading contractors and road builders so heartily endorse this great construction improvement naturally brings to us, its makers, a glow of pride, a sense of accomplishment, the satisfaction of work well done.

For we know that, in Carey Elastite Expansion Joint, responsible engineers recognize the achievement of a solid, substantial company with a record of more than fifty years of service. An indispensable construction improvement—a product of the very highest quality, made of the best and most carefully selected materials.

Carey Elastite Expansion Joint! The logical, lasting protection for concrete

work. The unfailing safeguard for the professional reputation of the construction engineer.



**Carey  
Elastite Expansion Joint**

... absorbs expansion and contraction, prevents overstresses in the structure, protects concrete against breakage, and extends its length of service.

... will not melt in hot weather, nor will it become brittle in cold weather. It lasts as long as the concrete.

... reduces maintenance expense and adds but a trifle to the cost of construction. Conveniently installed, for the pre-formed strips are as easy to handle as a board.

**THE PHILIP CAREY COMPANY**  
Lockland, Cincinnati, Ohio

**Carey  
Elastite**  
EXPANSION  
JOINT

## PORTABLE AIR COMPRESSORS



120 cu.ft. Size Illustrated \$1,650 f.o.b. Factory

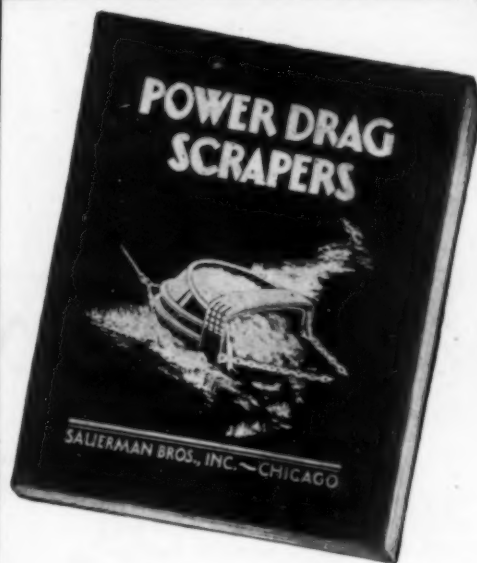
Furnished in sizes ranging from 15 to 360 cu.ft. both portable and stationary engine or motor drive, or truck and tractor mounting. "SCHRAMM" compressors cover all requirements of the field.

Conveniently located Stocks and Service.

**Schramm, Inc.**  
West Chester, Penna.

Offices and representatives  
in all important cities.

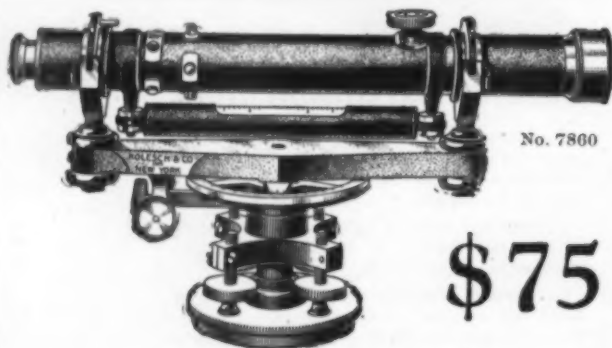
# Schramm



**T**HIS new 96-page booklet is filled with information on how you can reduce your excavating and material handling costs. You'll find page after page of descriptions, pictures and drawings, showing you what other users are accomplishing with Sauerman Power Drag Scrapers. Your name and address on a post card is enough to tell us where to send the booklet. There is no obligation. Mail the card today.

**SAUERMAN BROS., Inc.**  
480 S. Clinton St., CHICAGO

Manufacturers of Slachline Cableway Excavators  
and Power Drag Scrapers



No. 7800

**\$75**

## KOLESCH ARCHITECTS LEVEL

12-in. Telescope with clear definition. 20 diameters magnifying power. Constructed and built on lines of an Engineer's Y Level and will hold its adjustment longer than any other instrument of its kind.

Our catalogue describes  
this and other instru-  
ments in detail.

The "Protractor" keeps  
you up to date on the  
latest instrument im-  
provements. Let us put  
your name on our  
mailing list.

**KOLESCH & CO.**  
138 Fulton Street,  
New York City

KOLESCH & CO., 138 Fulton St., New York City.  
Kindly send me a copy of your Catalog, and put my name  
down gratis, for future copies.  
Name.....  
Company.....  
Address.....

# Buhl

AIR COMPRESSORS

Below is illustrated the BUHL Type C Portable Compressor—one of the many different types of this popular line. Moderate in original cost and low in upkeep.

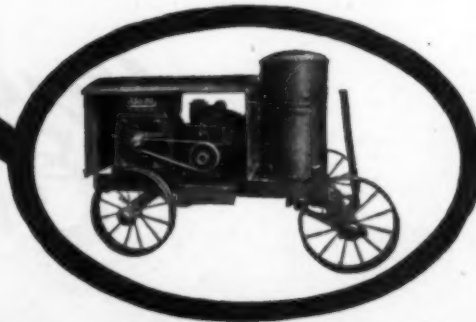
There are six sizes of portable air compressors in the BUHL line to choose from. For operating jack hammers, riveters, clay spades, concrete breakers, etc. The BUHL gives dependable air power at low cost—send for bulletins today.

Sales offices in principal cities

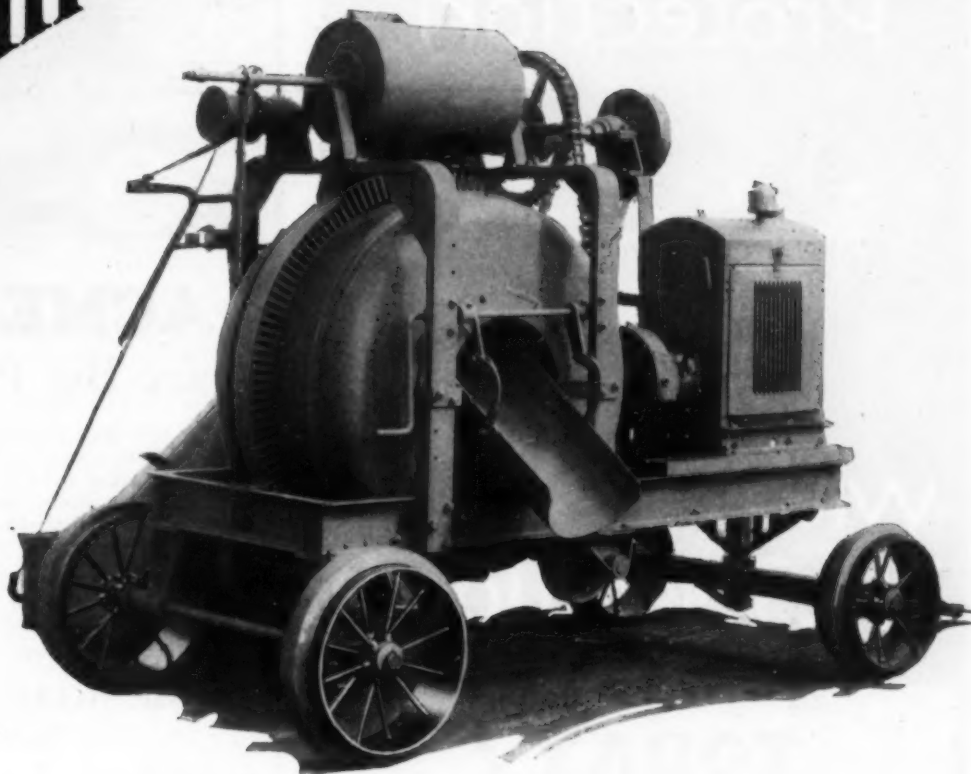
**THE BUHL COMPANY**

Manufacturers

37 W. Van Buren St., CHICAGO



# Announcing **The New Republic Roller Bearing Line**



**The Utmost  
in Quality**

***Republic***

**At the  
Lowest Price**

## **Points of Superiority**

- |  |  |
|--|--|
| (1) Hyatt Roller Bearing Construction Throughout | (7) Heat treated steel Cut Gears running in Oil. |
| (2) Bigger Drums                                 | (8) Short turn trucks                            |
| (3) Thicker Heads                                | (9) Countershaft Eliminated                      |
| (4) Heavier Trucks                               | (10) Chain operated Skip-shaft                   |
| (5) Higher and Wider Wheels                      | (11) Automatic throwout and brake                |
| (6) Simpler Construction                         |  |

### **Distributors**

There is still some territory open for this new line of roller bearing mixers. We will be glad to have your inquiries.

### **A COMPLETE LINE**

Tilters and non-tilters of 3½-5-7-10 cubic feet capacity. You will want complete information. Write today for latest catalogue and prices.



**Republic Iron Works**  
Tecumseh, Mich.

Republic  
Iron Works  
Tecumseh, Mich.

Gentlemen—Without obligation tell us all about them. Size....

Name .....  
Street .....  
City .....State .....



# Up-to-Date Protection

with  
The Toledo Torch

## TODAY!

**traffic conditions demand  
modern protection methods**

TOLEDO TORCHES pick obstructions out of the darkness and make them stand out in bold relief against the black background of night—something old fashioned lanterns could never do.

Unbreakable—no globes to replace  
Theft-proof—built for only one use  
Storm-proof—reliable in all weather

*Merit proven by extensive use*

**THE TOLEDO TORCH**



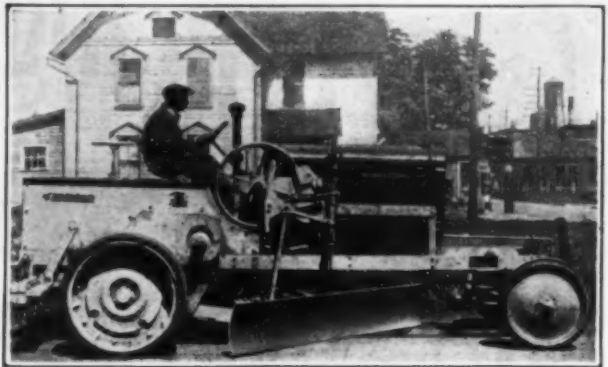
IT RIGHTS ITSELF

*We pay  
freight on  
18 Torches  
or more per shipment*

**List  
Price**  
\$20 per dozen

**THE TOLEDO PRESSED STEEL CO.**

12th St. and Woodruff Ave. Toledo, Ohio



## ACME Graders are Big Profit Makers

There is a type and size of Acme Grader to suit every requirement—horse drawn, tractor drawn or power driven. All are backed by a strong guarantee and built in the largest plant in the world devoted exclusively to road machinery. Our products have been proved in 30 years of service all over the world.

An investment in Acme Graders always pays big returns.

*Write for Catalogs covering our complete  
line of Graders, Rollers and Crushers.*

**ACME ROAD MACHINERY CO.**  
Frankfort, N. Y.

## This Is Your Ticket

*For a Free Tour of Over  
50 Ditching Jobs*

Here's a chance to make a free inspection tour of over 50 progressive ditching jobs, without going outside of your own door. Barber-Greene men have gathered information, pictures and layouts on interesting features of ditching work in every section of the country. The best of these have been collected in the 1927 edition of Ditching Snapshots and Records. Sending this ticket brings your copy—send it today.

Name .....  
Address .....  
City ..... State.....  
Company .....

**BARBER-GREENE CO.** 530 W. Park Av., Aurora, Ill.  
*Representatives in Fifty Cities*  
**BARBER GREENE**  
Portable Belt Conveyors Self Feeding Bucket Loaders  
Coal Loaders ..... Automatic Ditch Diggers ..... Coal Feeders

---

---

# *Side-lights . . .*

"Fills a need no other publication I know of supplies."

—a county engineer.

"Carries a very fine advertising section."

—a general contractor.

"One of the best magazines published."

—a city engineer.

"I like your 'step by step' pictures particularly well."

—another county engineer.

"Fills a long-felt need in the Construction Industry."

—a general contractor.

"It is a good advertising medium."

—a construction engineer.

"This picture magazine is an institution."

—U. S. Engineer's Office.

*.... and this one too*

"I always read the advertisements as I like to keep posted on new equipment and new methods of getting things done."

—a highway contractor.

## CONSTRUCTION METHODS

A McGraw-Hill Publication

McGraw-Hill Publishing Company, Inc., Tenth Avenue at 36th Street, New York, N. Y.

# SEARCHLIGHT SECTION

## EMPLOYMENT—BUSINESS OPPORTUNITIES—EQUIPMENT

### UNDISPLAYED—RATE PER WORD:

Positions Wanted, 6 cents a word, minimum \$1.25 an insertion, payable in advance.  
Positions Vacant and all other classifications, 10 cents a word, minimum charge \$2.00.  
Proposals, 50 cents a line an insertion.

### INFORMATION:

Box Numbers in care of any of our offices count 10 words additional in undisplayed ads.  
Discount of 10% if one payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals.)

### DISPLAYED—RATE PER INCH:

1 to 3 inches.....\$7.50 an inch  
4 to 7 inches..... 7.25 an inch  
8 to 11 inches..... 7.00 an inch  
An advertising inch is measured vertically on one column, 2 columns—30 inches—to a page.

C.M.

### POSITIONS VACANT

**EXPERIENCED** structural detailers wanted, single men preferred. Application should give telegraphic address. State experience and accompany sample drawing work. State salary desired. Address Box 654, Havana, Cuba.

**SEVERAL** detailers. Must have at least three years' experience making fabricating shop details, also one experienced miscellaneous iron detailer (not ornamental iron). Reply stating age, experience, salary desired, and when you can report for work. Whitehead & Kales Company, 2361 Beecher Ave., Detroit, Michigan.

**REINFORCED** concrete designer and detailer. Bar Company experience desirable but not essential. Good opportunity. Location Western New York. P-47, Construction Methods, Tenth Ave. at 36th Street, New York.

**STRUCTURAL** draftsman wanted. First class checkers for permanent positions. Only experienced man need apply, stating age, nationality, experience, salary expected and date available in first letter. Address Chief Draftsman, Lehigh Structural Steel Company, Allentown, Penna.

**STRUCTURAL** draftsmen—structural fabricator. Can use several first-class fast detailers and checkers to work in New York City. Salary commensurate with ability. P-46, Construction Methods, Tenth Ave. at 36th St., New York.

**WANTED** one checker and one detailer experienced in structural steel details for mill and office buildings: good opportunity for reliable men. Union Structural, Inc., Beech & Canal Sts., Syracuse, N. Y.

**WANTED** structural steel detailers and checkers who have had experience with fabricating plant. Orange Car and Steel Co., Orange, Texas.

### POSITIONS WANTED

#### Superintendents

**ASPHALT** superintendent, executive and mechanic, capable taking entire charge. Producer and organizer. Twenty years' experience. Any location. R.T.G., Box 387, Harwichport, Massachusetts.

**AN EXECUTIVE**, broadly experienced all classes building and other construction, available as construction or general superintendent, or in any position requiring a sound knowledge of all phases of contracting. PW-48, Construction Methods, Tenth Ave. at 36th Street, New York.

**BUILDING** superintendent with 20 years of experience in all classes of construction concrete, brick, wood and steel, deep foundation work, also concrete bridge construction. PW-54, Construction Methods, Tenth Ave. at 36th St., New York.

**CONSTRUCTION** foreman, 40, married; 18 years' experience; capable foreman with proven ability to handle work as general foreman or superintendent; willing to go anywhere. PW-50, Construction Methods, Tenth Ave. at 36th Street, New York.

### POSITIONS WANTED

**DREDGE** manager-superintendent. Eighteen years' responsible charge large dredging projects. River, harbor and canal excavations. Deep waterways, ship channels, fills, land reclamation, drainage. Highest reference. PW-44, Construction Methods, Tenth Ave. at 6th St., New York.

**HIGHWAY** superintendent, twenty years' experience, roads, bridges, heavy excavations, coffer dams, quarries. Competent to handle entire organization and confer with engineers. PW-45, Construction Methods, Tenth Ave. at 36th Street, New York.

**OFFICE** man, 15 years' experience in accounting and cost keeping, payrolls, etc., on various projects, and capable in purchasing and all office detail. PW-43, Construction Methods, Tenth Ave. at 36th St., New York.

**MAINTENANCE** superintendent or engineer; six years' experience state highways, bridges and motor equipment, field office and shop. Fifteen years general construction and maintenance. Practical civil engineer and draftsman. Can plan, organize and direct motor fleet, owners, central equipment repair shop. Executive with owners interests always first. Age 37, married. Location preferred, Southern or Coastal states, not necessarily binding; salary open. Permanent connection desired. Address Box 406, Napoleonville, La.

**STATE** highway subcontractor is desirous of submitting quotations on grading and concrete batch hauling to all contractors in New Jersey, New York, Pennsylvania and Delaware, possessing municipal state highway or county contracts. D. L. Wagner, 112 North Tenth St., Phila., Pa.

**SUPERINTENDENT** assistant, general foreman, in charge of different projects in Europe, reinforced concrete, bridges, foundations, channel excavations, etc., desires position with chance for advancement, references. PW-49, Construction Methods, Tenth Ave. at 36th Street, New York.

**SUPERINTENDENT** of construction, 20 years' experience in reinforced concrete and industrial buildings; can furnish skeleton organization. Will go anywhere. PW-52, Construction Methods, Tenth Ave. at 36th Street, New York.

#### Miscellaneous

**DIVER**, 15 years' experience on salvage work, wrecking and all kinds of submarine construction work in various countries. Expert in blasting and dynamiting. PW-51, Construction Methods, Tenth Ave. at 36th St., New York City.

**FOREMAN** on concrete roads, 12 years' experience, 10 years' reference with New York firm; wages immaterial just to show ability; age 37 years (with lots of pep). Fred Mayer, 342 West 123rd St., New York City.

**HAYWARD** dredge or Skidd machine operator, can set up machinery, do heavy rigging, pile driving and dock work "Sauerman dragline." Would make a good contractor's foreman. A. F. Ryden, North Haven, R. F. D. Montowese, Conn.

### POSITIONS WANTED

**WANTED**—Position as concrete slab foreman, good organizer, eight years' experience—or power operator three years' experience—write or wire. PW-53, Construction Methods, 7 So. Dearborn St., Chicago, Ill.

### PRICED FOR QUICK SALE

#### Derricks, all Types, Steam, Electric

220-ft. Portable Gas Air Compressor.  
100-ft. 8x8-in. Curtis belted Air Compressor.  
25-hp. to 300-hp Oil Engines.  
125-hp. to 250-hp. Natural Gas Engines.  
Locomotives, Steam, Gas Electric.  
Dump Cars, Dryer Cars.  
Shovels, Cranes, Steam Gas, Electric.  
Crushers, Screens, Elevators.  
700 tons 45-lb. Relay Rails, fine.  
Pipe, Tanks, Power Equipment.

#### Mid-Continent Equipment & Machinery Co.

220 North Fourth St., St. Louis, Mo.

### Ready for Delivery For Rent or Sale

1—Model No. 3 Northwest Crane, 35-ft. boom with bucket, 4 months old.  
2—21-E Rex 1/2 Length Cat. Pavers.  
1—21-E Smith Combination Cat., with wheels and spout.  
1—21-E Koehring. Full cat. Batchmeter. Water Tank. In Ind. Elegant Cond.  
1—Lidgerwood Cableway, brand new, 1,000 ft. span complete.  
5-s and 7-s Rex Mixers, power loader or low charging.  
1—Complete 1-yd. Archer Chuting Plant with Hoppers.  
1—14E Koehring Pavers.

#### Superior Supply Co.

1800 So. Kostner Ave., Chicago

## RAILS

### DEPENDABLE SERVICE

Track Supplies Contractor's Plant  
**E. C. SHERWOOD,** 140 CHURCH STREET  
NEW YORK

### Bear Cat Crane

Fine Condition. Price Low.  
Located New York City

JAS. S. BRADEN,

30 Church St., New York City

### Largest Stock of Used Surveying Instruments in this Country

Satisfaction guaranteed or money refunded. Write for complete list and catalog of our high grade instruments and supplies for civil engineers, surveyors, mining, builders, contractors, etc.; 40 years' experience in repairing instruments of all makes at reasonable prices. Prompt service.

#### WISSLER INSTRUMENT CO.

615 N. Broadway, St. Louis, Mo.



## Rebuilt and Guaranteed

### Partial List Pumps and Compressors

#### Air Compressors—Belted

24x16 in. Bury.  
12x12 in. Laidlaw-Dunn-Gordon.  
10x10 in. Ingersoll-Rand.  
9x9 in. Curtiss Duplex.  
6x6 in. Chicago, Model G.S.B.

#### Air Compressors—Steam

7x8x8 in. Marsh.  
4x3x6 in. American.  
4x3x5 in. Union.

#### Centrifugal Pumps

2—10 in. Allis-Chalmers.  
1—10 in. Special.

#### Steam Pumps

9x7x12 in. Worthington Duplex.  
7½x4 in. Laidlaw-Dunn-Gordon-Duplex.  
4½x8 in. Deming Triplex.  
8x5x8 in. American.  
7½x7x7½ in. National.

Also All Kinds of Metal Working Machine Tools,  
Approximately 3,000 to Choose From

## Riverside Machinery Depot

*The Used Machinery House*

251 St. Aubin Ave., Detroit, Mich.

## Why buy wood sheeting?

You can save money by renting Steel Sheet-Piling from Wemlinger, Inc.—and do a more satisfactory job.

We maintain stocks of Steel Sheet-Piling throughout the country, for sale or for rent.

**Wemlinger, Inc.**  
149 Broadway, New York

## STEEL SHEET PILING

Saves you money and trouble in  
Foundation, Cofferdam, and Sewer  
work.

Bought-Sold-Rented—Always carried in stock

LONG DISTANCE TELEPHONE: CENTRAL 0491

**S.W. LINDHEIMER**

31 South Clark St.

CHICAGO



## CRANES

### CATERPILLAR CRANES

1—Type B, ERIE Steam with 40-ft. Boom ASME  
Boiler Shop No. 2375 with 19-6 high lift  
Shovel Boom if desired.  
1—McMyler No. 2 Steam with 40-ft. Boom ASME  
Boiler Shop No. 3394, Cap. 10-ton.

### LOCOMOTIVE CRANES

1—OHIO 30-ton Model F with 50-ft. Boom Bucket  
operating ASME Boiler Shop No. 3530.  
1—Brown-Holst 25-ton No. 4 Type C with 50-ft.  
Boom ASME Boiler Shop No. 9461.

*Write for Stock List 120 for Stock of*

Boilers, Buckets, Compressors, Concrete Mixers,  
Concrete Tower Equipment, Cranes Derricks, Drag-  
lines, Locomotives, Pumps, Rail & Track, Saw Rigs,  
Steam Hammers, Steel Piling.

### Equipment Corporation of America

Pittsburgh, Pa., 857 Empire Bldg.  
Phone: Grant 5148  
Chicago, Ill., 1457 Roanoke Bldg.  
Phone: Randolph 6586  
Philadelphia, Pa.  
657 Horn Bldg., 1601 Chestnut St.  
Phone: Rittenhouse 5498

## BARGAINS

### Retiring from Business

*A reasonable offer from a con-  
tractor who can judge good used  
equipment will buy this equip-  
ment.*

1—27E. Koebling Paver, practically new,  
4,000 ft. 9-in. Heltzel Road Forms practi-  
cally new.  
12—Hug, One-Batch Road Builder's Trucks.  
1—Shawnee Tractor Blade Grader.  
2—6-ft. Western Blade Graders.  
1—7-ft. Adams Blade Grader.  
2—Rougher Gauges, 22 to 28 ft. width.  
2—Sack Cleaners, complete.  
1—Byers Bear Cat Crane with crane and  
pull shovel booms.  
1—Barber-Greene Bucket Loader.  
1—Barber-Greene 7-ft. Ditcher.

### Walter S. Anderson

6519 Kimbark Ave., Chicago  
Tel. Hyde Park 9126 Palos Park 35R2

### O & S Gasoline Crane

40-ft. boom, used 5 months, like new,  
wheel traction. Priced low for cash.

HUNTER MACHINERY CO.  
Milwaukee, Wis.

### SHOVELS, CRANES AND DRAGLINES

1—P. & H. 200 gas cat. comb crane and shovel,  
new 1924.  
2—Link Belt gas cat. cranes K1 and K2 2 yrs. old.  
1—Koebling No. 2 gas cat. shovel 1½ yd. 3 yrs. old.  
1—Osgood H.D. 1 yd. gas cat. comb. shovel and  
crane, new 1926.  
Link Belt Shovel and Crane attachments for K2  
machine.  
WN shovel attachment for NW 104 1½ yd.  
dipper.  
NW trench hoe attachment for NW 104 machine.  
1—20 ton Brown Holst, 3 wheel loco. crane std.  
gg. 50-ft. boom.  
1—22 ton O&S 8 wheel RR type crane with 45-  
in. magnet.

### MISCELLANEOUS

1—Jordan 80,000-lb. capacity all steel Air  
Spreader; will rent.  
2—Western std. gg. Hand Spreaders; will rent.  
40—1½ yd. 24-in. gg. Koppel V shaped Dump  
Cars; will rent.  
50—1½ yd. 24-in. gg. Western Wooden Dump  
Cars; will rent.  
20—5 yd. 36-in. gg. Western Dump Cars, steel  
sills; will rent.  
50—12 yd. std. gg. Western Dump Cars, steel  
sills; will rent.  
4—16 and 18 ton 36-in. gg. steam saddle  
Tank Locomotives.  
5—25 to 30 ton std. gg. steam saddle Tank  
Locomotives, American.  
1—45-ton std. gg. American saddle Tank Lo-  
comotive, guaranteed cond.  
We also have good bargains in Crushers, Con-  
veyors, Compressors, etc. Send us your inquiries.  
**Houck Bohan Equipment Co.**  
178 W. Adams St., Chicago, Frank 2468

## Who's Getting the Big Contracts?

### A Monthly Guide to Where the Construction Dollar is Being Spent

#### Far West

**Pasadena, Calif.**  
Apartment hotel and store: \$2,500,000  
Orndorff Constr. Co., 247 North Western Ave., Los Angeles.

**Oakland, Calif.**  
Store and office: Exceed \$500,000  
Dinwiddie Constr. Co., Crocker Bldg., San Francisco.  
Aqueducts: \$1,427,054  
Lock-Joint Pipe Co., Ampere, N. J.

**San Francisco, Calif.**  
Department store: \$500,000  
McDonald & Kahn, Financial Center Bldg.  
Office: \$500,000  
Lindgren & Swinerton, Inc., 225 Bush St.

**Richmond, Calif.**  
Cargo building and wharf: \$454,000  
California Constr. Co., 225 Bush St. San Francisco.

**Los Angeles, Calif.**  
Apartment: \$400,000  
E. T. Davis Constr. Co., 416 Taft Bldg.  
Steel plant: \$350,000  
Baker Iron Works, 712 North Broadway.

**Harper, Ore.**  
Earthwork: \$261,666  
W. H. Puckett Co., Boise, Idaho.

**Los Angeles, Calif.**  
Apartment: \$350,000  
L. A. Rose, 1274 South Western Ave.

**San Jose, Calif.**  
Laundry: \$225,000  
E. Nommensen, 28 North 1st St.

**San Francisco, Calif.**  
High school: \$350,000  
Barrett & Hilp, 918 Harrison St.

#### West of Miss.

**Minneapolis, Minn.**  
Apartment hotel: \$400,000  
C. E. Betcher & Co., Loeb Arcade.  
Day labor.

**Kansas City, Kan.**  
Abattoir: Est. \$400,000  
Miller-Stauch Constr. Co., 503 Railway Exch., Kansas City, Mo.

**Minneapolis, Minn.**  
Auditorium: \$600,250  
Paul Steenberg Constr. Co., 914 Builders Exch. Bldg., St. Paul.

**Cheyenne, Wyo.**  
School: \$393,936  
Adams & McCann, Wheatland.

**Texarkana, Ark.**  
Station: \$1,700,000  
Stewart-McGhee Constr. Co., Kahn Bldg., Little Rock.

**St. Louis, Mo.**  
Apartment: \$850,000  
Supervision D. R. Harrison, archt., 1106 Ambassador Bldg.  
Separate contracts.

**Tulsa, Okla.**  
Hotel: Est. \$550,000  
Van Horn, 526 South Kenosha St.

**Omaha, Nebr.**  
Hotel: Est. \$2,000,000  
Seiden Breck Constr. Co., 205 Arthur Bldg.

**El Paso, Tex.**  
Pipe line: \$1,750,000  
Pipe Nat'l Tube Co., Lorain, O., \$1,000,000  
Laying: Hulihan & Chestnut, and Lang Transportation Co., \$600,000, Los Angeles, Calif.  
Stringing: Tibbette & Tibbette, \$150,000 Olathe, Kan.

**Fort Worth, Tex.**  
Theatre and office: Est. \$1,000,000  
Hewitt Constr. Co., 701 Taylor St.

**Galveston, Tex.**  
Hotel: Est. \$1,000,000  
Bellows-Macley Co., Kirby Bldg., Dallas.

**Texas and Kansas**  
Railway: \$1,000,000  
Platt Rogers, Inc., and Cole Bros., First National Bank Bldg., Pueblo, Colo.

ON THIS PAGE *Construction Methods* lists some of the high-spot jobs for which important contracts have recently been let.

If you are looking for equipment prospects or for an employment opening in new territory, the information on this page may be of help in indicating where construction is active.

The contracts listed are, of course, only a few of the total number recently let. You may wish to ask about others. If so, address your inquiries to:

Searchlight Dept., *Construction Methods*,  
Tenth Ave. at 36th St., New York

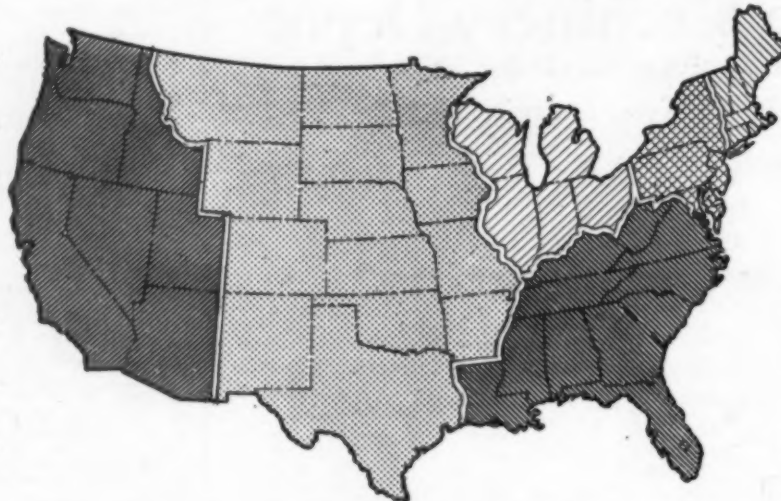
**St. Joseph, Mo.**  
Cereal plant: Est. \$3,000,000  
Leonard Constr. Co., 37 South Wabash St., Chicago.

#### Middle West

**Akron, O.**  
Surgical and nurses home: \$917,000  
Carmichael Constr. Co., Central Savings and Trust Bldg.

**Chicago, Ill.**  
Synagogue: Est. \$1,000,000  
Hegeman-Harris Co., 431 North Michigan Ave.

**Ohio**  
Paving: Total \$2,072,875  
Cleveland Trinidad Paving Co., 886 The Arcade, Cleveland (\$1,239,314).  
Hill & Hill, Elyria, (\$102,290).  
Monongahela Constr. Co., Fair-



**Lakewood, O.**  
Apartment hotel: Est. \$3,000,000  
J. Gill & Sons, Bulkley Bldg., Cleveland.

**Ft. Wayne, Ind.**  
Store: Est. \$1,000,000  
W. A. Sheets, 334 Utility Bldg.

**Zanesville, O.**  
Tile Manufacturing: Est. \$400,000  
Austin Co., Union Trust Bldg., Pittsburgh, Pa.

**Chicago, Ill.**  
Sewers: \$3,794,850  
Nash Bros., 10 South La Salle St.

**Indiana**  
Cement: Total \$2,500,000  
Universal Cement Co., Buffington (\$1,000,000).  
Lone Star Cement Co., Limesdale, (\$700,000) and others.

**Milwaukee, Wis.**  
Bridge: \$946,637  
Stein Constr. Co., 425 East Water St.

**Mentor, Ohio**  
Dredging and bulkheads: \$300,000  
R. C. Hoffman Co., Elyria, O.

**Illinois**  
Paving: Total \$2,803,092  
Hamilton-Hoffman, Carbondale, (\$681,550).  
Madison Constr. Co., Edwardsville, (\$494,081) and others.

**Lansing, Mich.**  
Factory: Est. \$750,000  
H. G. Cristmen Co., Porter Apts.

mont. W. Va. (\$396,978) and others.

**Detroit, Mich.**  
Club and office: Est. \$2,000,000  
Blair Constr. Co., 3212 Book Tower.

**Pontiac, Mich.**  
Bank and office: Est. \$1,000,000  
Everett Winters Co., 1651 East Grand Blvd., Detroit.

**Chicago, Ill.**  
Bank and office: Est. \$10,000,000  
Paschen Bros., 111 West Washington St.

**Indianapolis, Ind.**  
Store: Est. \$1,500,000  
E. C. Strathmann Co., 712 Meyer-Kiser Bldg.  
Central States Bridge & Structural Co., 601 Beecher St. and others.

**Detroit, Mich.**  
Office: Thirty-five story  
W. E. Wood Co., 1335 Penobscot Bldg.

#### South

**Louisville, Ky.**  
Hotel: Total \$600,000  
B. E. Buffalo & Co., 658 East St., Memphis, Tenn.

**Fort Benning, Ga.**  
Barracks: \$138,450  
Palmer Sipey Constr. Co., Eliza beth Ave., Charlotte, N. C.

**Morgantown, W. Va.**  
Roads: \$151,705  
Cole Bros. Constr. Co., Morgantown.

**South Carolina**  
Highways: Total \$351,300  
Porter Constr. Co., Dothan, Ala. (\$208,530) and others.

**Kentucky**  
Highways: Total \$1,289,681  
L. des Cognets Co., Lexington (\$347,601).  
Codell Constr. Co., Winchester (\$379,870).  
Ellis & Brantley, Owensboro (\$415,410).

**Hollywood, Tenn.**  
Compress: \$300,000  
R. E. Lee Wilson, Wilson, Ark.

**Charleston, W. Va.**  
Bank and office: Est. \$2,500,000  
James Stewart & Co., 17 East 42nd St., New York, N. Y.

**Atlanta, Ga.**  
Viaducts: \$816,931  
MacDougald Constr. Co., 180½ Spring St.

**Spartanburg, S. C.**  
Factory: Est. \$250,000  
Fiske-Carter Constr. Co., Spartanburg.

**Waycross, Ga.**  
Textile mill: Est. \$1,500,000  
Walter Knapp & Co., Inc., 207 East 43rd St., New York.

**Alabama**  
Highways: Total \$1,938,022  
Nixon & Phillips, Lincoln Life Bldg., Birmingham (\$944,139).  
J. B. Turner, American-Traders Bldg., Birmingham (\$149,321) and others.

**Lake Charles, La.**  
Hotel: \$600,000  
McDaniel Bros., Beaumont, Tex.

#### Middle Atlantic

**New York, N. Y.**  
Loft and showroom: \$2,000,000  
B. B. Davis & Co., 3 East 44th St. Separate contracts.

Apartment: \$1,500,000  
Joseph Pottein & Sons, 247 Park Ave. Separate contracts.  
Loft, store and office: \$1,500,000  
R. H. Howes Constr. Co., 103 Park Ave.

Office: Est. \$2,500,000  
G. Richard Davis & Co., 10 East 41st St.

Studio: \$1,500,000  
Walter Russell, 1 West 67th St. Separate contracts.

Apartment: Est. \$6,000,000  
Starrett Bros., 101 Park Ave.  
Apartment: Est. \$1,500,000  
T. E. Rhoades Co., 342 Madison Ave.

Office: Est. \$1,000,000  
G. A. Fuller & Co., 949 Broadway.  
Office: Est. \$3,000,000  
G. A. Fuller & Co., 949 Broadway.

**Yonkers, N. Y.**  
Apartment: Est. \$2,000,000  
Lordi Constr. Co., 36 East 208th St., New York City.

**Albany, N. Y.**  
Hospital: Est. \$1,250,000  
J. P. Sewell, 372 Hudson Ave.

**St. George, N. Y.**  
Apartment: \$1,200,000  
St. George Gardens, Inc., 26 Court St., Brooklyn. Separate contracts.

**Buffalo, N. Y.**  
High school: \$1,077,300  
Mosier & Summers, 1206 Seneca St.

**Philadelphia, Pa.**  
Theatre: Est. \$1,000,000  
Golden Constr. Co., 1600 Arch St.

**New Jersey and Pennsylvania**  
Bridge: Total \$7,500,000  
Steel to Bethlehem Steel Co., 143 Liberty St., New York.

**Ambridge, Pa.**  
Beam plant: \$1,000,000  
American Bridge Co., Frick Bldg., Pittsburgh, Pa. Owner builds.

**Syracuse, N. Y.**  
Office: Est. \$1,200,000  
J. E. Heffernan, 721 So. Salina St.



## INDEX TO ADVERTISERS

Page	Page	Page	Page
Acme Rd. Mchry. Co. .... 86	Cleveland Rock Drill Co. .... 53	International Cement Corp. .... 57	Ransome Concrete Mchry. Co. .... 44-45
American Cement Mch. Co. .... 74	Cleveland Tractor Co. .... 65	Jaeger Machine Co. .... 78	Republic Iron Works. .... 85
Amer. Steam Pump Co. .... 72	Clyde Iron Works Sales Co. .... 71	Kochring Co. .... 60	Roebbing's Sons, John A. .... 51
Anti-Hydro Waterproofing Co. .... 70	Continental Motors Corp. .... 3rd Cover	Kolesch & Company. .... 84	Rogers Brothers Corp. .... 68
Atlas Portland Cement Co. .... 75	Dietz Co., R. E. .... 53	Lakewood Engineering Co. .... 39	Sauerman Bros. .... 84
Austin Western Road Mchry. Co. .... Insert 55-56	Eisemann Magneto Corp. .... 62	LeRoi Company. .... 50	Schramm, Inc. .... 84
Baker Mfg. Co. .... 82	Fate-Root-Heath Co. .... 63	Leschen & Sons Co., A. .... 43	Searchlight Section. .... 88
Barber-Greene Co. .... 86	Footo Company. .... 69	Lowell Wrench Co. .... 78	Smith Co., T. L. .... 66
Barnes Mfg. Co. .... 74	Foundation Co. .... 42	McGraw-Hill Book Co. .... 52	Starrett Co., L. S. .... 72
Bates Valve Bag Corp. .... 64	Fundom Hoist & Shovel Co. .... 80	Marsh-Capron Co. .... 82	Sterling Wheelbarrow Co. .... 81
Bay City Dredge Works. .... 61	General Electric Co. .... 58-59	Metal Forms Corp. .... 66	Sullivan Machinery Co. .... 48
Blaw-Knox Co. .... 35	Good Roads Machinery Co. .... 30	Milburn Co., Alex. .... 70	Texas Co. .... Second Cover
Brooks Co., R. E. .... 64	Hayward Co. .... 73	Morris Machine Works. .... 78	Thew Shovel Co. .... Insert 37-38
Browning Crane Co. .... 70	Hercules Motors Corp. .... 46	Northwest Engineering Co. .... 18-19	Toledo Pressed Steel Co. .... 86
Bucyrus-Erie Company. .... 40-41	Homelite Corporation. .... 52	Novo Engine Co. .... 80	Union Carbide & Carbon Corp. .... 92
Buffalo-Springfield Roller Co. .... 74	Huber Mfg. Co. .... 76	O. K. Clutch & Mchry. Co. .... 76	Universal Crane Co. .... 47
Buhl Company. .... 84	Hughes-Keenan Co. .... 82	Owen Bucket Co. .... 77	Universal Portland Cement Co. .... 3
Carey Co., Philip. .... 83	Humphreys Mfg. Co. .... 49	Plymouth Locomotive Works. .... 63	Walker Cement Products, Inc. .... 67
Carter Co., Ralph B. .... 70	Insley Mfg. Co. .... Fourth Cover		Watson-Stillman Co. .... 91
Caterpillar Tractor Co. .... 54			Witchell-Sheill Co. .... 68
Cleveland Container Co. .... 91			



### SAFETY IN UNDERPINNING

Is assured by use of

### Watson-Stillman Independent Pump Hydraulic Jacks

Accurate—Dependable—Easy to Repair

These Jacks are being used extensively by Underpinning and Foundation Contractors for underpinning work, sinking piles under foundations and making tests of footings

THE WATSON-STILLMAN CO.

1014 Evening Post Bldg., New York City

Chicago, 549 W. Washington Blvd. Cleveland, Auditorium Garage Bldg. Philadelphia, Widener Bldg. Detroit, 7552 Duboise St.

## CUTTING COSTS ON CONCRETE WORK

WITH Cleveland Paper Tube Products great savings in labor and material are obtained in concrete form work. Cleveland Bolt Tubes permit full salvage of form bolts, and enable the form to be quickly removed. Form bolts may be removed by one man.

Cleveland Dowel Sleeves for road work are economical to use wherever dowel pins are used. The construction of the sleeve automatically holds the dowel pin for proper expansion movement.



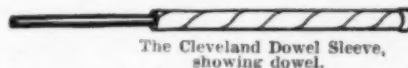
Concrete Test Container 6-in.x12-in. inside, capped, paraffined inside and out.

There are other Cleveland Paper Tube Products to help you. Tubes for casting holes for railings, conduit, etc., tubes for blue print filing and mailing, special tests containers, special tubes to order.

Use the coupon. Write today for complete information.



Paper tube used to prevent bolt from becoming imbedded in the concrete.



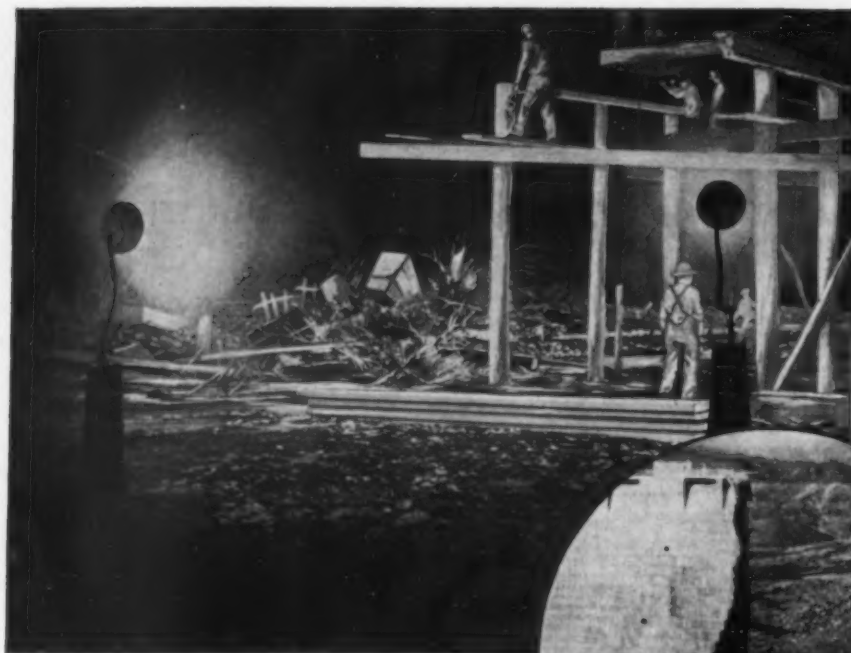
The Cleveland Dowel Sleeve, showing dowel.

**The Cleveland Container Co.**  
10720 Berea Road Cleveland, Ohio

THE CLEVELAND CONTAINER CO.  
10720 Berea Road, Cleveland, Ohio  
Please send me samples of  
Bolt Tubes ☐ Test Container ☐ Blue Print Tubes ☐ Dowel  
Sleeves ☐ and quote prices (specify size).

Name \_\_\_\_\_ Street \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ C.M.





Rapid reconstruction of a bridge swept away in St. Francis Dam disaster

#### Style No. 2

This popular model weighs only 115 pounds fully charged. It can be charged in a few minutes to burn for twelve hours.

## When good light is needed *quickly*

**A** RAILROAD WRECK . . . a flood . . . a fire. A watermain breaks. A structure crumbles. For night catastrophes such as these, good portable light is an absolute necessity.

The Carbic Flood Light is ideal for any night emergency. It is always ready for immediate use and can be carried right to the scene of trouble. It supplies a strong diffused light, bright but not glaring. Its simple rugged construction assures long life. 14 years of use have proved its low cost of operation.


A majority of the railroads use Carbic Lights. Practically every city water department depends on them for all night work.

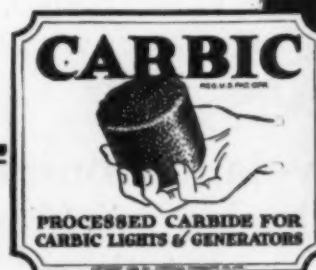
Equip yourself with Carbic Lights and be prepared for night emergencies. Your jobber can supply you.

# CARBIC LIGHT

OXWELD ACETYLENE COMPANY

Unit of Union Carbide and Carbon Corporation

New York City  Chicago  
30 East 42d Street Peoples Gas Bldg.  
San Francisco, Adam Grant Bldg.



Carbic is distributed by the Union Carbide Sales Company through its national chain of warehouses and is sold by jobbers everywhere.

# Dependable Power for Every Purpose



Austin Backfiller powered with model P-35 heavy duty Red Seal engine.

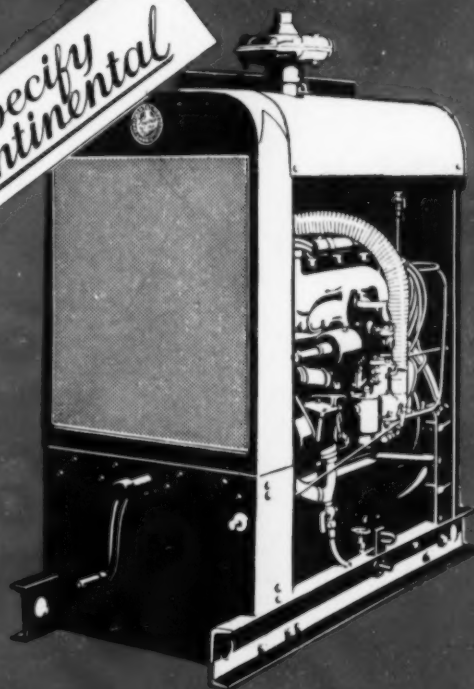
## For the Pace Makers in Industry

Big jobs require power that proves up to the hourly needs—today, tomorrow, next year.

Red Seal Continental motors give the user the dependable power that, in the end, means greatest economy. These products of 27 years of specialized experience are designed with a full knowledge of the power requirements of leading industries. Each Red Seal Continental motor recommended for a specific job will do the work with an efficiency and economy so vital to present day profits.

CONTINENTAL MOTORS CORPORATION  
INDUSTRIAL EQUIPMENT DIVISION  
Office and Factory: Muskegon, Michigan  
*The Largest Exclusive Motor Manufacturer in the World*

*Specify Continental*

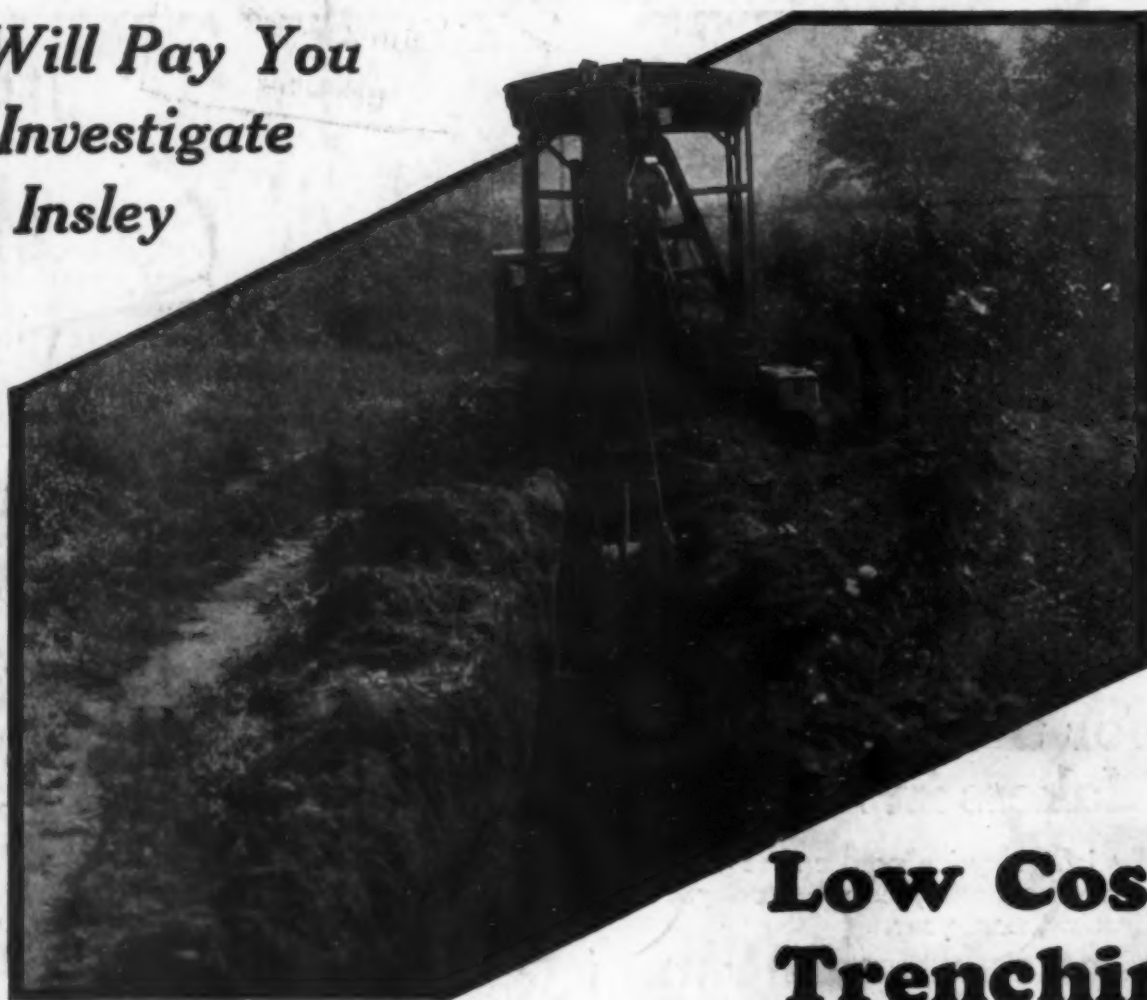


# Continental Motors

# INSLEY

SHOVEL — Ditcher — Skimmer — Dragline — CRANE

*It Will Pay You  
to Investigate  
the Insley*



## Low Cost Trenching

**T**HE Insley Ditcher is the ideal machine for sewer or water line trenching. On the average job consisting of a shallow straight trench, where speed counts, the Insley has speed. For trenches running through ground filled with boulders and rock, the Insley has power and stamina. For deep trenching, either in clay or in loose and runny soil, the Insley Ditcher, Crane or Dragline are flexible, fast and dependable.

The Insley is a one man machine. Its fuel consumption and other factors of operating cost are low, and its performance is all that could be desired. That means trenching at a low cost per lineal foot.

Furthermore, a backfiller plate can be put on the ditcher bucket which enables the same machine to backfill in an hour's time all the trench that it can dig in seven hours.

The Insley also has Shovel and Skimmer Attachments for road and street grading, and for stripping and material handling.



**INSLEY MANUFACTURING  
COMPANY - Indianapolis**

621  
**Engineers  
and  
Manufacturers**